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NOTE ON METHOD IN ANTHROPOLOGY

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IN his presidential address for 1940 to the Royal Anthropological Institute Professor Radcliffe-Brown regrets the absence of agreement among "social anthropologists" as to the precise meaning of terms, confessing that social anthropology thereby reveals itself as "not yet a formed science."[1] He asserts also that in a true natural science there is no place for "schools" of opinion, but that the science should be one, and without "orthodoxies and heterodoxies."

Whether or not Radcliffe-Brown cares to regard himself as leader of a school, he cannot escape the fact that he is a prominent advocate of the conception of one side of anthropology as concerned primarily with social phenomena, secondarily perhaps with cultural phenomena. There are others—a majority, it may be—who prefer to confine, or largely to confine, the activities of that side of anthropology to cultural phenomena. In this debate there is difference of opinion, not merely about whether "cultural" or "social" is the better term to apply to a certain class of phenomena, but upon a much more complex question: namely, whether there are or are not two classes of phenomena; if there are, where the demarcation between them lies; and what, if any, order of reality should be ascribed to the two, or the one. The question of terms is an incidental which could easily be disposed of if there were agreement upon concepts and aims. This debate is one of the broader debates among anthropologists. It has not developed such a large literature as the debate among those who agree that cultural anthropology is cultural

1 A. R. Radcliffe-Brown, *On Social Structure* (Journal, Royal Anthropological Institute, vol. 70, pp. 3-12, 1940).

anthropology but not about what "culture" is, or does. There is also a debate, still flickering on, as to whether anthropology, social and/or cultural, can become a science at all; this debate is nearest to fundamentals.

Why are there all these debates among anthropologists, with a few sociologists and the odd biologist or two snapping at their heels? I think there is a very important reason for this, a reason moreover which none of the debaters, so far as I know, has penetrated.

Each of the various sciences has its usual basic entities: atoms in physics, molecules in chemistry, animals in biology (also living cells, not considered here), human beings and events in the social sciences, and perhaps also culture traits and/or institutions—the social sciences are not yet very clear about what use they make of the two latter. Each of these basic entities may be considered in its quality as an individual, sometimes must be so considered, and in the present discussion the individuality of each atom, animal, human being or event, and the numbers of such individuals, are important.

The natural sciences, physics, chemistry, etc., deal with great numbers of individuals or entities, and their method of knowing is descriptive classification, so far as possible upon a quantitative basis; it is, in fact, a main objective of those sciences to reduce all qualitative distinctions to quantities. One important side of biology, the taxonomic, follows the same method, but deals with far fewer individuals than physics does. It is thus interesting that there sometimes arise doubts in taxonomy such as it would be difficult to imagine arising in physics or chemistry. Even the most complicated of coal-tar products is far less refractory to classification than the duck-billed platypus.

Now cultural anthropology (as I shall, without personal conviction, hereafter call it in deference to majority opinion) may be viewed in one of two ways as related to other sciences: either it is one side or aspect of the biology of a single species; or, *more* Kroeber, it is the science of the "superorganic." Whichever it is, it is concerned with fewer individuals than taxonomic biology is. There are sufficiently few of them to create much more serious problems of classification than biology faces—problems, often enough, as to how classes themselves shall be constructed; problems, sometimes, as to whether classes may even be said to exist.

There is another study, history, in which, as it is said by some, the student is concerned only with individuals as individuals. The historian is, on this basis, supposed to be concerned to establish particular events and their succession to one another, and at that to stop. As a historian by training, I think that opinion is remarkably naive, for the supposed operation is impossible. Merely to describe an individual, a particular event, the student is compelled to compare it, even if only implicitly and in his own mind, with others, and therefrom there arises somewhere a rough classificatory context. The very use of language will not permit the historian to evade this. Certainly, he is concerned with individuals, but, as Croce has it, with the individual in the universal, and with the universal in the individual. One reason why the historian's operations may be a useful lesson to the cultural anthropologist is that he deals with individuals, a relatively small number of individuals, sometimes rather fewer even than the cultural anthropologist usually deals with.

The other reason the historian's operations are instructive for the cultural anthropologist is that they are historical: they describe, or should do, by discerning developmental process. Operations of this kind may be called the second method of knowledge, as against the first method, classification. The distinction between the two methods has been admirably discussed by Hugh Miller in his *History and Science*,[2] a small book every scientist and historian ought to read.

Historians have been little troubled with precision of technical terminology, for they have very rarely attempted the positive operation of establishing classes, where precise terminology becomes essential. Biologists were at first little troubled with it, for the opposite reason: their operations began with classification, and thus *ab initio* exact terms were required and all biologists bent their energies toward setting up a satisfactory system. Their entry, with Darwin, upon use of the historical method of knowledge, has, however, led them into difficulties about concepts, and so about the terms which shall denote them, so that today such an eminent biologist as R. A. Goldschmidt calls in question the ground for the master

2 Hugh Miller, *History and Science: a Study of the Relation of Historical and Theoretical Knowledge* (Berkeley and Los Angeles, 1931).

concept, species. For some three centuries the natural scientists enjoyed a remarkable agreement about terms and were able to solve their conceptual problems without the complication of doubts as to what they were, or ought to be, trying to do. Every inorganic substance seemed to vary in one way only, quantitatively, or, more correctly perhaps, in a single quantitatively interdependent group of ways; if it varied otherwise, it fell into another classification and so was disposed of.

But today even the natural scientists are in difficulties, for the reason that they are now attempting to deal with small numbers of individuals, even with single individuals, molecules and atoms, and with those individuals, if that is what they are, of which atoms are constructed. It is with a certain incredulity that they face the old cylinder of gas, whose pressure bears a constant proportion to its temperature, and find that they were always dealing in that common phenomenon only with an average of countless millions of molecules, that each individual molecule may be behaving quite differently from each other molecule. Each molecule has its own history; perhaps in groups of relatively small numbers they have something analogous to social structure or even to culture. There seems to be no doubt that electrons, protons, neutrons, if there really are such things, have each their characteristic behavior.

Here we are concerned with the conceptual and terminological difficulties of cultural anthropologists. I suggest that these have arisen from the fact that the anthropologist deals with just the numbers of individuals which are rather many to describe usefully, each for itself, by the historical method, rather few to give reliable classifications. The latter means that the anthropologist has never dealt with such large numbers as to be able to fall into the blissful ignorance—that is what it was—of the natural scientist which led him to assume identity among individuals of one of his classes. (It is elementary in philosophy that nature has no identities.) What, then, should the anthropologist do? He should use both methods, and, by reason of his subject matter, is ideally placed for correcting the one method with the other. He need not make the characteristic errors either of the historian or of the natural scientist. He always knew that there were no identities among his individuals, and he has classificatory procedure at hand to correct the vagueness and

inconsequence which beset historians. For my part, I can see no difference in proper method between the historian and the cultural anthropologist, while the sociologist, when he is doing something sensible, seems always to have been indistinguishable from the cultural anthropologist. The only defensible distinction between the three sciences is the mere choice of subject matter, and this distinction should on no account be made a sharp one, for breadth of vision would thereby be rendered more difficult, and ultimate judgments perhaps qualitatively weakened.

It was, then, entirely natural that there should be much debate about concepts and aims between anthropologists. The debate is no doubt bootless when it runs off into mere verbalisms—as when Radcliffe-Brown supposes that nobody will call the relations among bees "cultural"; the only reason against so calling them is the one to be found in the dictionary. I hardly think that the debate is bootless when it becomes amateur philosophy, for this rather frequent occurrence may sometimes bring that large enlightenment which seems nowadays to come less and less sufficiently from professional philosophers. I am prepared to say, however, that debate about concepts and aims and about the precise combination of the two methods of knowledge for use upon particular subject matter is a permanent part of the anthropologist's business. Regret for inability to agree about terms is really quite out of place in this science, for it is not inability to agree about terms as such (except in a few instances of peculiar obstinacy), but about concepts which the terms denote; the terms inevitably get mixed up in the very proper debate about concepts. And beneath this debate there lies something of the greatest importance to all knowledge, something which may be approached in the manner following.

We have seen the inorganic, the organic, and the "superorganic"—a concept considered further in a moment—yielding progressively smaller numbers of individuals (units) to observation by the human senses, and so to knowledge by the human consciousness. It may be that there is a major significance in this progressive diminution. If there is, however, it is to be emphasized that it inheres in numbers apparent to the human senses, not necessarily in objectively existing numbers. (This does not imply a belief in the subjectivity of all knowledge, but merely in its relativity to the human senses; what *is*

observed may just as well exist objectively as subjectively.) Put in another way, this means that the individuals involved in superorganic process *may* be very numerous indeed; they may be more numerous than those involved in organic process, and those involved in organic process may be more numerous than those involved in inorganic. There would, of course, be no doubt that this were so if we knew for a fact that inorganic molecules were themselves active determinative individuals in organic process, and not merely passive objects, and, similarly, if we knew, as some affect to do, that organic processes played a determinative part in superorganic process. But we do not know these things, and most of us assume that what are determinative in each order or realm of process are the individuals and entities not present in the lower orders, that the entities of lower processes offer only a sort of accidental inertia or momentum in the operations of higher processes. What diminish, then, so far as present human knowledge goes, are the individuals which are new successively at each of the three levels of process.

And so, again as far as present human knowledge goes, the situation in the realm of the superorganic, the social, cultural, or sociocultural—whatever term be preferred—may be of one kind, or it may be of another kind. If the relatively small number of individuals is real, then this is probably for the reason that this realm or order of process is the latest in time to have emerged in the total evolutionary process of nature, which carries the implication (confirmed very broadly in science) that individuals (units, entities) increase numerically in any natural realm with the passage of time. If this should prove to be the fact, I am in favor of Kroeber's (originally Herbert Spencer's) concept of this realm as superorganic, and as marking a new major emergent in evolution, just as the supervention of organic life upon inorganic existence marked a new major emergent. (If it should here be objected that the terms "emergent" and "emergence" have been used differently from this, the reply is that they have been used in several different ways, and that I am perfectly agreeable to any term—any word—which will carry the meaning. See, however, for the term used as here, Kroeber's article on *So-Called Social Science*.[3])

3 A. L. Kroeber, *So-Called Social Science* (Journal of Social Philosophy, vol. 1, pp. 317-340, 1935-36).

If, however, the relatively small number of individuals is only apparent, then I should say not only that the concept of the superorganic is erroneous, but also that our concept, as held hitherto, of the distinction between organic and inorganic is erroneous, but that not all knowledge amassed on a basis of those concepts is to be jettisoned. In either case, the study of society and culture is very evidently the sphere of knowledge in which uncertainties must be expected to be most pervasive, the sphere in which apparently hard and exact fact must be expected frequently to reveal the sort of fluid basis which the pressure-temperature of gases and atomic structure have recently revealed. Is it not entirely likely that this should be so in the case of knowledge of the sphere of nature whose existential basis is itself predominantly the human mind? What parts and aspects of that mind are covered by operations of its own consciousness? Certainly not all of them. These things being so, it seems unlikely that we can ever reach a final decision as to what the concept "culture" covers, or perhaps even the concept "society." We must use them in tentative, not-ultimately-defined senses, constantly correcting classifications from history, and history from classifications. Those who say that anthropology is searching for this and not for that, or that history or sociology are similarly limited, speak only for themselves, or for their schools, and speak only about practical conveniences, not about demarcations existing objectively in nature. Truly, there shall be no orthodoxies and heterodoxies. Instead, the anthropologist-sociologist-historian, and the anthropologist, the sociologist, and the historian should recognize, and proclaim to others, that in their studies debate about concepts, radical reorientation of aims, critical consideration of total existing knowledge, sweeping rectification of terms, and differences among schools upon all of these matters, constitute one of the major ways of advancing knowledge.

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A YUROK WAR REMINISCENCE: THE USE OF AUTOBIOGRAPHICAL EVIDENCE

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VERY FEW autobiographies[1] or biographies[2] have been published from the California Indians, and these only from the eastern and southern edges of the state. The set of the native Californian cultures was not such as to develop striking personalities, and the fortunes of most groups since 1850 have tended toward the humble or squalid rather than toward the picturesque.[3] Nevertheless, with biographies now available from Southwest, Northwest, and Plains, additional comparable material from California would be desirable; and I therefore present a very partial autobiography which I recorded among the Yurok in northwest California on September 11, 1902. But first, a few reflections on the history and function of biography and autobiography in ethnology.

I THE PLACE OF AUTOBIOGRAPHY IN ETHNOGRAPHY

In probably his last paper, printed posthumously, Boas challenged the autobiography as being of limited value, and useful chiefly for the study of the perversion of truth by memory.[4] This may seem extreme, yet it should not be lightly discarded as merely the opinion of a man who lived long enough to become outmoded to those for whom recency is the most significant feature of thinking. Of course, Boas did not contend that autobiographies were wholly useless as material in ethnology. The specific problem of method is whether the autobiography will or will not contribute something

1 Julian H. Steward, *Two Paiute Autobiographies* (University of California Publications in American Archaeology and Ethnology, vol. 33, pp. 423-438, 1934). See also Gertrude Toffelmier and Katherine Luomola, *Dreams and Dream Interpretation of the Diegueño Indians* (Psychoanalytic Quarterly, vol. 5, pp. 195-225, 1936), in which is imbedded a shamanistic autobiography.

2 Julian H. Steward, *Panatübiji', an Owens Valley Paiute* (Anthropological Papers, no. 6, Bulletin, Bureau of American Ethnology, no. 119, pp. 183-195, 1938); obtained posthumously from the subject's grandson.

3 Somewhat like the Walapai autobiographies secured by MacGregor, McKennan, and Mook and published on pp. 204-229 of *Walapai Ethnography*, edited by myself (Memoirs, American Anthropological Association, no. 42, 1935).

4 Franz Boas, *Recent Anthropology* (Science, vol. 98, pp. 311-314, 334-337, 1943).

that cannot be obtained from other approaches to the investigation of culture. As regards the actual content of culture, as well as its patterns, it seems quite possible that Boas was right. No doubt, any sufficiently lengthy and detailed autobiography, or biography, will manage to turn up this and that cultural item or attitude which has managed to escape even a persevering ethnographic questioner. But again, the fullest autobiography, or a dozen of them, are almost surely bound to happen not to touch on a good many areas, or spots, of the culture either. There is of course no absolute demarcation between the two approaches. As soon as questioning becomes specific, any informant is likely to supply concrete evidence—whether he names names or not—out of the life experience of himself, his kinsmen, or other particular members of his society. The problem thus assumes this shape: Is it more advantageous to have a thousand concrete exemplifications all related to the life of one individual, or to be scattered among many individuals? From the point of view of learning what the culture is and how it operates, I think it can fairly be maintained that the latter is likely to give a more random and truer sample. That is probably part of what Boas meant.

Of late it has become fashionable to emphasize that culture is an abstraction—not only culture in general but any culture. This is obviously true, in the sense that life, or species, or states of mind, or even personality, can also be conceived as abstractions, if one so wishes. What seems to be basically involved in many of the affirmations on the abstractness of culture is a lack of interest in culture, as compared with other things. From this point of view, it is not culture which is really to be investigated, but something else, to which, it is true, culture stands in enough relation that it must be considered, even if only to eliminate or control it. This other thing of interest is usually personality, or the interrelations of personalities. From the angle of such an interest in personality, it is evident that a thousand items of culture all having reference to one person are going to have vastly more significance than a thousand items referring to dozens of individuals, especially if these individuals remain anonymous and unidentifiable. However, such a personality interest, while wholly legitimate, is no longer primarily cultural or ethnographic—perhaps not even anthropologic, if the word anthropology is to retain any definiteness of inclusion.

An in-between position was Sapir's, who was interested in culture —as a linguist, first and last, he had inevitably to be keenly concerned in superindividual forms—and who was also interested in personality. He therefore liked to apperceive and interpret cultural data in the humanistic tradition, as seen through the medium of personalities. This procedure presumably raised for him a flat, two-dimensional picture into a three-dimensional, stereoscopic one, with solidity of perspective: it does so for many of us. Sapir, however, was as sensitive aesthetically as intellectually. We may cheerfully grant that a culture presented through the medium of personalities is the richer as a work of art, and yet question whether it is rationally sharper, or more effective for further inquiry.

We all remember Sapir's passionate plea on "Two-Crows denies this."[5] It is a shrewd suspicion that J. O. Dorsey, inhibited missionary as he presumably was, also preferred his culture saturated with the savor of concrete personality. But he refrained from summarizing the life history or evaluating the character and proclivities of Two-Crows and the other informants that balance him. Technically, Dorsey was just keeping the record straight as to the sources of his information, where these were discrepant—protecting himself in his trusteeship of Omaha culture. He was still a long way from biographies, and much farther from autobiographies.

Many anthropologists perhaps do not realize the extent to which the two differ. A biography—if more than a panegyric—is the intendedly objective story of a life in the setting of its mainly cultural milieu. It can therefore pass, to a certain extent, as an exemplification of a culture by an individual life. An autobiography is necessarily subjective, and, if honest, is avowedly so. The culture included may be portrayed truthfully, but it is portrayed subjectively. There are excellent biographies by Plutarch and Ssŭ-ma Chien. Autobiographies—excluding unrounded religious confessions —go back in all literature only to Rousseau and Franklin—not quite two centuries. That a genre or method is recent does not condemn it; but it is cause for reflection.

To sum up, it seems we do what we are interested in; which is legitimate enough. All that can be asked is that we know what we

5 The actual title is: *Why Cultural Anthropology Needs the Psychiatrist* (Psychiatry, vol. 1, pp. 7-12, 1938).

are doing and why. The *Son of Old Man Hat* is a concrete document that must have taken close to 1,000 hours to record. Dyk evidently liked writing down what his informant said, much as the informant liked telling it. If he had liked finding out the forms and functioning of Navaho culture, his patience would have given out before he got a tenth through the endless story, from which, as he drifted peacefully along, he must have seen problem after problem of Navaho culture coming into sight and receding again unanswered—in fact unasked.

Perhaps we shall have an answer to the question raised by Boas when someone—if there ever is such—who has done a first-class full-length portrait of a culture, and who has also edited a full-length autobiography from that culture, will pronounce an inside verdict on the relation of the two endeavors.

II CIRCUMSTANCES OF THE DOCUMENT

Now as to the present Yurok document. It was secured, in keeping with anthropological field method at the time, not from psychological interest in individual personalities—even the word personality did not then have its present technical sense—but, like J. O. Dorsey's statements from Two-Crows, as a concrete, personal exemplification of the working of a set institution. These were the antecedents.

In 1901, I spent the late winter months among the Gros Ventre of Montana, in a briefer companion study to that which I had made of the Arapaho in 1899 and 1900. The Gros Ventre age-graded ritual organization proved to be more decayed than the Arapaho one, and to allay certain doubts as to the sequence of societies, the age of their members, etc., I asked several informants to tell me the order in which they went through the rites. This was elementary enough, and today it might be among the very first requests which a field ethnographer would put; but it seemed to me a new and fruitful device then. So I applied it also to war stories, not with any primary notion of ascertaining how a particular Gros Ventre felt in battle, let alone how raiding parties molded his character, but because a listing of all a man's fights, and better yet all the fights of several men, would give a truer sample of the nature of the average Gros Ventre war exploit, of the average war participation, and the

like, than giving informants their head to select those episodes which best satisfied them. Then, hearing of a woman who had gone on a war party, been captured, and escaped, I secured her story.[6] That I should record this cluster of incidents but nothing of her previous or subsequent life, will seem strange to the generation that is young now; but that is the way investigations were being made forty-four years ago. We were trying to find out about whole cultures then because we were interested in them; we were not using cultures as stepping stones to analyze out personalities or techniques of social climbing or class conflicts or ways of bettering the world.

Later in the same year of 1901, I returned to California, and to the Yurok, whom I had briefly visited in 1900; and in 1902, I spent a long summer with them and neighboring tribes. Hearing of Sregon Jim as the Yurok who had fought most and lived to tell about it, I wanted his story for much the same reasons that I had got the Gros Ventre ones eighteen months before. I was merely following a pattern through in a somewhat new situation. That is why I secured a reminiscence instead of an autobiography.

Jim gave me other, impersonal information. In *Yurok Narratives,* Robert Spott and I have published a miraculous experience or gift which befell Jim's greatgrandfather or other ancestor; to which we have added some personal recollections of the old man himself,[7] including record of his usual Yurok name, Srä'-mäu, Sregon Widower, acquired before his marriage to his second wife, a famous doctor. From her I obtained in 1906 or 1907 her story of how she acquired her powers, given in somewhat condensed form in the *Handbook of the Indians of California.*[8] Part of the general statements in the *Handbook* about how Yurok doctors are made and operate[9] were given me by Jim in 1902, with his wife furnishing an increasing share of the information as the interview progressed.

A few days before I reached Sregon, upriver at Murek, an old man there called Jack told me some items of Jim's fights. These are

6 *Ethnology of the Gros Ventre* (Anthropological Papers, American Museum of Natural History, vol. 1, part 4, 1908). On succession of rituals, pp. 233-234; war records, none wholly complete, pp. 196-216; woman's narrative, pp. 216-221.

7 *Yurok Narratives* (University of California Publications in American Archaeology and Ethnology, vol. 35, pp. 167-171, 1942).

8 Bulletin, Bureau of American Ethnology, no. 78, 1925, pp. 65-66.

9 *Idem,* p. 64. This is supplemented in *Yurok Narratives,* pp. 155-157, 162-164.

appended to Jim's own account, and agree sufficiently well, though not absolutely. The two versions are telescoped into one and condensed into a paragraph on page 51 of the *Handbook*.[10]

Background for the present document will be found not only in the two works already cited,[11] but in Waterman's *Yurok Geography*,[12] and in my *Yurok Law*.[13]

III SREGON JIM'S REMINISCENCE

1. [*Education*]—When I was a boy, the old men told me what to do.[14] They knew all the ground and the little creeks, and they told me where I must wash in the night when I came from the sweat-house. Then I would never become sick, and would not be killed if I was shot at in fighting.[15] Now some boys believe what the old men tell them. Then they will become married easily. For when there is illness everywhere about, and such a young man remains consistently well, a sick man may say to him, "I wish you would do this and that work for me; and I will give you my sister for it." Long after he has followed what he was told, and the old man is dead, the young man will think about him, and will cry for him, while he is gathering sweat-house wood. He will do that because he remembers the old man and all his words which he told; and perhaps he also remembers that he got his wife as the result. Then he becomes always more eager to go up into the hills after sweat-house wood, and there he always begins to cry [and this brings him more luck].

10 I hesitate to justify this merger, even in a general book; apparently I got the authorship of my two sets of field notes confused in copying them out. The correction in *Yurok Narratives*, p. 170, that the paragraph in *Handbook*, p. 51, is from a Murek informant (see Section IV below) is only partly true: the printed passage is a composite.

11 *Handbook*, Chapters 1-4, deal with the Yurok, and in *Narratives*, Stories 15-18 refer to fighting and settling.

12 University of California Publications in American Archaeology and Ethnology, vol. 16, pp. 177-314, 1920.

13 Proceedings, International Congress of Americanists, 22nd Session at Rome (1926), vol. 2, pp. 511-516, 1928.

14 When an old Yurok was asked to describe a custom, he generally began by telling a myth about its origin—and sometimes thought it unnecessary to go any farther. Asked about something that befell himself, he was likely to tell how he learned wisdom from the old and thus lived to have the good fortune inquired about. This introductory paragraph thus is, to an old-fashioned Yurok, a real foundation for the mere incidents of biography that follow.

15 The narrator generalizes, as befits a solid moralist; but at the same time he evades telling precisely where he bathed at night and what he saw there that gave him health and invulnerability.

2. [*Antecedents to a Feud*]—Three women had come from Orekw to live in Ko'tep.[16] Then there was much sickness around Ko'tep and neighboring towns, and many people died. So there began to be talk that perhaps these women had caused that. But a kinsman of theirs at Ko'tep said that he would not let anyone hurt them; and when people continued to talk of killing them, he took them into his own house for protection.

But now his own fellow townsmen turned angry at him, because he was keeping the women safe while people were dying on their account all around.[17] So, when he went downriver to Oyôł, they killed him there with help from Weitspus.[18] Thereupon one of the three Orekw women was killed at Ko'tep: a man pursued her into the house and killed her with a knife. He was a relative of their protector, but held her responsible as the occasion of his kinsman's death at Oyôł.[19]

Later, in the settlement for these killings, one of the housemates of the protector was given one of the two surviving Orekw women as wife.[20] The third woman went back to Orekw.

3. [*First Feud*]—But now, after the first woman had been killed, I went down to Ko'tep, because I did not want the other two to be killed.[21] I thought it best if they were sent back to Orekw. When I came to Ko'tep, people were still talking of killing them both. I

16 Orekw was on the coast, near present Orick, but Wohkero, Ko'tep, Pekwon (and after the flood of 1861-62, Wohtek) were close together on the northeast side of the Klamath River near the later store and post office of Johnsons or Klamath Bluffs. Sregon is a few miles upstream on the same side.

17 Typical motivation. —Also typical expression: "dying all around" may have meant one or two or three deaths.

18 Oyôł is well downriver, perhaps eight miles. Jim killed several foes there later. There may be a connection. Whether any Ko'tep or Oyôł people had a direct hand in this murder is not clear. The story gets hazy whenever someone on the teller's side loses his life. This is not only partisanship, but due to extreme aversion to mention dead kinsmen or even refer to them. Cf. notes 28, 41, 49, 57.

19 This is characteristic Yurok reasoning and good enough provocation in law.

20 Probably a brother, possibly a nephew or cousin. However, if the dead man had protected her along with her sister or companion because they were kinswomen, she would also be kin to her new husband. Perhaps this particular woman was not related; or so distantly that it could be overlooked.

21 How the narrator was involved, who the women were and why they left Orekw, would be pertinent; but it is also the kind of information that an old-time Yurok would not be likely to mention without being specially trained or cross-examined.

took one of them by the arm and said to her, "Come with me! The best thing for you to do is to go home." So the women came with me down to the river, where I was going to set them across. I was young then, and had never fought. I had a companion. We had nearly reached the river bank when a crowd of people came after us from Ko'tep. They were threatening to shoot; but my partner shot first with his bow, and hit in the hand a man who was aiming at me. So I let go of the women, ran back toward the town, and began to shoot too. Then someone hit me in the belly. I did not want to pull the arrow out, so left it in and ran after the man who had shot it into me. Then there was a big turmoil as we fought.[22]

When I returned to Sregon I was nearly dead, and could not sit up straight. So they made a frame for me, something like a fishing scaffold,[23] and I leaned forward on that. Americans were already in the country, and one of them came and tried to draw out the arrowhead, but only cut himself. So I told him, "Don't try: you can't get it out." Thereupon I went to sleep; and dreamed I was where they were making the fish dam at Kepel. A lot of young men were on the flat. After a time they all ran off, each to his own camping place, as they do when they let the long poles fall at the end of the ceremony. Then, looking around, I saw one man with large ears, as big as those of a mule; but I did not know what kind of a person he was.[24]

When I awoke, I got up, and felt as [well as] I do now. All the pain was gone. The arrow point is still in me.[25] It was an iron point.

Now I decided to get the Ko'tep man who had shot me. I caught and killed him inside a sweat-house at Lamb's Riffle, Olĭken,[26] where

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22 Big confusion and excitement, but probably no serious casualty beyond Jim's belly wound and the hand.

23 Usually V-shaped, a pole and a plank running out to meet a pile (or perhaps two poles with a plank lashed across them). See *Handbook*, plates 4, 7.

24 This dream would be interesting to know more about, but in 1902 we were not asking. I suspect that the successful closing of the fish dam ritual is a reassurance; but the mule-eared person is a puzzle.

25 This seems physiologically unlikely, especially in a young man's abdominal wall.

26 Olĭken or Erlĭken is a famous salmon fishing camp near Lamb's Riffle, well downriver from Ko'tep, and two or three miles below Oyṓ; but it was not a year-round town, and hence would ordinarily not have had a sweat-house. But Waterman (*Geography*, p. 236) mentions a sweat-house pit there, and memory of two houses and

he had run off to after our fight at Ko'tep. He shot from out the sweat-house and wounded several of us. One of my companions was shot in the nose, one in the hand and just above the ankle. I myself was shot by him in my side, under the arm, but not with injury. Then we succeeded in killing him.

After that I was ready to pay settlement for him, and his relatives named what they wanted. Of course, I had to give what they asked. Then I was poor for a time, because I had to pay much of what I owned, obsidians and woodpecker bands and dentalia. So that was settled, and there was no more fighting over it.[27]

4. [*Second Feud*]—After that, a woman came upriver from Ko'tep and told my relatives that it was being planned there for me to be killed. I had lost some of my kinsmen[28] by sickness which we thought had been sent against us from Ko'tep,[29] when a man from there had come and said, "I know who made your people die. Now give me some of your best arrows. But I want really good ones." This was an offer to kill the poisoner for me; so I gave him my arrows. We continued to wait, here in Sregon, because he had said he would shoot the poisoner in Ko'tep; but we never received the news. It was then that the woman came and said it was I who was slated to be killed. She said, "He is the very one who made your people here sick, and then got your arrows from you." When we heard that, we thought, "Let us kill him."

a sweat-house at Erliken-pets a little upriver. Perhaps the refugee was in a make-shift "sweat-house" in the woods away from the river in the general Oliken vicinity; or it was the off-season for fishing and he hid in an empty sweat-house which some old man had built himself for the annual weeks in camp there. I have slept in this sort of a sweat-house which stood overlooking the river at E'nipe'u, without any dwelling houses near it. It had been used by an old canoe-builder who from time to time hollowed out his logs there.

27 This is the end of the first episode. However, as the second one also involved primariliy Ko'tep people, we may assume that enmity had not died out with the present settlement, and that the second set of fights were really part of the same feud. (God only knows what bitterness between certain families of Ko'tep, Sregon, and Orekw preceded the first episode—perhaps a generation or two back.) At any rate, though acceptance of weregild is supposed to effect full reconciliation, and manifest behavior must be friendly, the Yurok nevertheless, knowing the blackness of their own hearts, expect those who have taken settlement to continue to feel bitter and to try to take below-belt revenge by witchcraft or "poisoning."

28 One brother, according to Murek Jack below. Note the deliberate vagueness of the reference.

29 In secret revenge—see note 27.

So we went after him, and found him not far away, above Yohter,[30] and killed him.

5. [*Attempts to Settle*]—Then I wanted to pay settlement. I tried for a long time, and at last the other side agreed, and came for the settlement pay here, just down the bank from the town alongside the river. But whenever they and we began to confer there, someone on their side began to fight.[31] [In these flare-ups,] men on both sides were wounded, but no one was killed.[32]

After a few days I sent word once more that I was ready to pay, and again they agreed and came to the same place. But again one of them started shooting and the settlement was stopped.

After five or ten days I thought, "I'll try it again."[33] It was at the same place. When they began to arrive, a man from Weitspus came and said to me, "Watch out: they do not want to settle; they are coming just to fight."

Now we had brought all the payment inside one of the houses here at Sregon, because we were afraid of just that, namely that the settling would again turn into a fight. The dentalia were all laid out in flat baskets and these were set on the fish-drying frame that hangs inside the house.[34] I was down below toward the river when I heard a shout from the house. A man from Meta, on our side, had gone in to get some arrows.[35] As he started to leave, he failed to look above and knocked the baskets off the frame with his

30 Across the river, between Sregon and Pekwon. Note the complete lack of incident: "we killed him." Alone? from ambush? on the trail or in the brush or at his canoe? with or without chance to resist? A Plains Indian's public account would be formalized almost into a ritual, but it would mention something concrete at least about the stroke; and his narrative told at leisure would surely give details.

31 If the account is accurate there were four of these abortive settlement attempts, after which the feud was resumed on larger scale.

32 Until the fourth time.

33 This would have been the third try.

34 This is a frame of four poles, or a series of several such frames, hung from the two roof plates over the central pit of the house, more or less in the smoke of the fireplace (see *Handbook*, plate 9). Slabs of salmon hang from it by withes to dry, or to finish drying; and, the Yurok being for the most part retentive of their belongings rather than tidy about how they keep them, all kinds of other things are likely to find their way onto the frame. (The men's sweat-house is scrupulously neat inside, as the result of almost nothing being kept in it: merely head-rest blocks, a pipe, a bit of fuel—no food, clothing, or baskets—see *Handbook*, plate 10).

35 He was not wanting to shoot anyone—all four times it was the other side that began to fight again—but of course he was not going to be caught unprepared!

head.[36] The detalium strings fell on the floor and some of them broke.[37] That was when the women in the house shouted to me down at the river, "All the money is broken!"[38]

So I ran up to the house, though carrying nothing but a knife. Then a woman somewhere behind called to me, "Stop!" I had seen men in front of my house and thought they were of our side, but she was crying to me, "They are enemies! Run back!" So I answered, "No, I won't run off. Let them kill me, if they can; I will go up."

When I came to where they were standing, they called out, "We came here to fight." I answered, "Go ahead, if you like." They spread out to both sides until I was almost in their middle, and began to shoot at me. Nearly all of my people were still down at the river, except that two men from Weitspus, who were right at the house, were shooting for me. Then down by the river fighting also started. At first it was as if I knew nothing. Then suddenly I realized my knife hanging from my wrist by its thong, grasped it, and made straight at one of the enemy. When they saw that, they became afraid and drew back. This time they were shooting with guns as well as arrows. Then that fight died away. Again no one had been killed.[39]

The next settlement try, the others again started shooting, and this time a man[40] got killed. He had come across from Meta to watch the settlement, which was again scheduled for the river bar downhill from here at Sregon. When the shooting began, he was standing behind our men and ran uphill to get out of the way, but was killed nevertheless. This is just how it happened: They shot

36 As has repeatedly happened to me. The lowest poles of the scaffold were usually perhaps four to five feet up. People sat, or slept, or stooped under them.

37 A broken detalium is illegitimate as money, and really is good only for incorporation in one of the thick necklaces of dentalium pieces. There is a theoretical chance to counterfeit by covering it with the red snakeskin in which dentalia are often cased (possibly originally as a guard against breakage); but no Indian would be fooled by any such simple device.

38 This sort of loose exaggeration into "all" or "never" is typical, both in Yurok and in the Yurok's English.

39 This rings true, if not heroic. In the face of numbers he gets obstinate but "knows nothing," then suddenly remembers his knife, and when he charges with this, the bowmen flee. Evidently nobody really kept his head.

40 On the fourth settlement flare-up, there finally was a fatality. According to Jack's account, below, he was not a neutral spectator, but one of Jim's partisans.

at me with arrows, and I dodged. The Meta man was behind me; heard the noise of shooting, and looked around, when a musket ball hit him in the throat. As soon as he dropped, there was a general fight.

After this I went upriver, because I felt badly and did not want to stay around.[41]

6. [*Climax of the Fighting*]—When I returned home to Sregon, I heard that the people of Ko'tep were afraid,[42] and many of their men had gone to Rekwoi at the mouth of the river. I thought, "Well, let's try to catch them," and I selected[43] nine men. During the night, we started from here, and at daybreak we were below Serper, when I said to my men, "Let us stay here for the day," for I had heard that they would be returning then. So we waited where the current of the river swings in toward shore.[44] Before long we saw a large boat coming downstream full of people, for not all of the Ko'tep people had gone to Rekwoi.[45] In the boat we saw some of the Ko'tep men who had fought us, including the old man who was leader in the last fight.[46] When they came abreast, we fired at them with our guns.

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41 This is certainly glossed over hazily enough. The interpreter later told me that, besides the Meta bystander, another man was killed, who was Jim's kinsman—presumably a fairly close one—and that therefore Jim disliked telling about it. Characteristically, the interpreter, who was both a family and personal friend of Jim's, also evaded all details; no doubt because, if I were indiscreet and later mentioned the details, Jim would feel hurt and aggrieved at him. Maintenance of good relations all around seemed to demand foregoing further knowledge. It is not even clear whether the kinsman was killed at the settlement skirmish or waylaid afterward. Also, it is a fair conjecture that it was prudence rather than grief that made Jim go into hiding upriver. His party may have suffered a definite discomfiture about this time. At any rate, from now on the fighting becomes less skirmishy and more effective.

42 "Also afraid" we might emend.

43 This was no doubt done in council, but Jim's was the traditionally leading house in closely-knit Sregon, and as its resolute representative, if not already its formal head, his decision would have been determinative.

44 I was shown the place, and Jim certainly had them at his mercy. The current swings boats in close to the right bank, which is first to the east and then to the north, and which is covered with brush and overhung with trees.

45 I. e., another boat from Ko'tep came downriver while they were waiting for the first one to work its way upstream past them.

46 This suggests there may also have been neutrals in the canoe, but these would not have been aimed at and would have to take their chances at clearing out of the way. If at that they got hit, compensation would go to their relatives.

Some jumped into the water, but four were hit. Two of these recovered, but two died.[47]

After that I left Sregon again and went to Kepel. Most of my side had scattered.[48] Then someone came to me with a warning: "Be careful: there are many out after you, hiding around in the brush." So we were prepared, and the next day, fought again. On my side one man was shot and killed, but we killed four of them.[49]

7. [*Final Settlement*]—Then I counted that we had killed eight of them altogether.[50] I paid for these eight. I had nothing left. Everything I owned I paid over.[51] So that was settled, and there was no more fighting.

The reason they settled was that they had repeatedly tried to kill me and could not. They had hidden out near here at Sregon for ten days, waiting for me. Once I had come toward them in plain sight, but they failed to recognize me.[52] It was after this that they gave up and decided they might as well accept settlement.

After that, no one fought me any more. All were afraid of me, and I had settled properly.[53]

8. [*Aftermath*]—The only other fighting I did was different. Upriver some Karok had killed cattle and then run off. A white man who came to arrest them was killed. Then those who had killed him kept moving about, never coming into their homes but staying out in the brush; and more people got killed. Some of the fugitive Karok were hiding out in the hills around here. Because the Americans could not find them, one of them came to me and said, "They

47 Jack's account says four killed, besides wounded.

48 Had gone to their home towns or were in hiding.

49 Again only skeleton information—there was a death in the group, so the episode is painful even forty years after.

50 Ten, says Jack, below, plus three on Jim's own side. But eight more nearly fits Jim's own story: one at Yohter, two at Serper, four at Kepel. The man killed at Oliken would make it eight, but he had been settled for.

51 "Everything" is to be construed in the sense of note 38. His kinsmen, who had helped him kill, no doubt also helped him pay. Besides, there was settlement coming in for the three losses sustained: the Meta man, the other kinsman about the same time (note 41), one killed at Kepel.

52 Due to the supernatural protection acquired by his night bathing in youth.

53 There was no doubt he was feared, respected, and idealized a bit. A man like Jim asserted his individual ego by relentless fighting; but he also conformed to social law, and therefore strengthened society, by being willing and able to compensate fully.

have killed too many. If you will kill them, we will pay you so and so much; and as long as you live you can come to Hoopa[54] each year before winter sets in and get food for yourself. And in addition you will have the money now." Now I thought I would do that. So I kept watch. When I went down to Wohkero, I saw one of the Karok who came out of the brush to visit a kinsman there. So I shot him on the spot.

Then I went upriver and reported to the white man.[55] And he was very glad. But I never got even one cent of money, nor any food from Hoopa. And I could not go upriver among the Karok because of this killing, which I never settled for because I did it at the Americans' order.[56] If I had wanted to kill the man on my own account, I would of course have expected to pay for him.

IV MUREK JACK'S VERSION

This is about a feud that Sregon Jim was in. His brother[57] died and Jim thought he had been killed by witchcraft or poison[58] from Ko'tep or Wohkero. So Jim killed the man he suspected.[59] After that the father of Opn of Sregon went to Ko'tep and was killed there. Then the two sides came together at Sregon to settle the feud. They had gathered, and were ready to dance,[60] when a young man, because he was "too smart," or just for fun, began shooting. So a new fight was precipitated, in which a man from Meta on Jim's side was killed.

After that Jim heard that some of his enemies were going down-

54 The Indian Agency, and for a time a military post.

55 "Upriver" suggests Orleans, which was for a while the seat of a large Klamath county. It may have been an unauthorized deputy sheriff who made the illegal offer, if indeed it was not a private rancher or miner.

56 He was quite correct: to the Yurok the instigator is liable. Moreover, why should Jim be out of pocket for a white man's satisfaction? To settle in such a case would be weakness, akin to paying blackmail.

57 Indefinite "some of my kinsmen" in Jim's own version.

58 Bewitching, usually called "Indian deviling" in English, and still believed in, is working with an uma'a outfit; "poisoning," ohpo', is such in our sense, with a substance.

59 This is the Ko'tep man killed at Yohter.

60 The Yurok war dance of incitement was repeated, strangely enough, at settlement. Presumably those who had lost a kinsman danced it to demonstrate that they were ready to fight to avenge him, even though they had agreed to accept settlement; the others, to show that they were ready to go on fighting if settlement was broken off. As a mechanism toward peace, the custom often boomeranged.

river in a boat, so he waited in hiding on the shore near Serper. The boat came downriver full of men, and they shot at it and killed four and wounded others.[61] None were hurt this time on the Sregon side. In this war Sregon was alone against Wohkero and Ko'tep and Pekwon,[62] but lost only three men altogether, the other side ten.[63]

Sometimes in a fight no one would be killed. It was hard to hit a man. Somehow arrows seem to fly past him, when it is easy to hit a deer.[64]

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61 Contrast the text to which footnote 47 refers.

62 It must not be assumed that the towns fought as political units. This does seem to have been true of Sregon, which consisted of but a few houses and those all related; but that was an accident. Pekwon and Ko'tep were large enough to contain several lineages, and any of these that had not been specifically aggrieved would take pains to stay neutral. Witness the false ally from Ko'tep, and the woman from there who denounced him; also the first Ko'tep man who lost his life for protecting the Orekw women against his fellow townsmen. —While Sregon acted as a unit, it is not quite true that it "was alone"; witness the Meta man killed, and the two men from Weitspus who shot on Jim's side from his house. Also, Sregon is usually said to have had four houses, which would indicate a total population of around thirty, which might conceivably have sufficed to furnish the ten fighting men for the Serper ambush on the boat; but more likely Jim "selected" some of his company from able-bodied kinsmen elsewhere.

63 Contrast note 50.

64 I suspect that the events centered more or less around 1860, or about ten years after the Americans entered the district. Bows were still used, but guns also. The government post at Hoopa was an established concern. There is little mention in the story of Wohtek, but Ko'tep is still a large town. The 1861-62 floods ruined much of Ko'tep, and Wohtek got part of its population. Jim, in 1902, looked to me as if he might be 72, or born about 1830; which would make him thirty years old at the feuds. In his younger twenties he might have been fully active in actual fighting, but he would hardly have selected men and ordered them about and taken the lead in paying settlements.

WRITING AS A MEDIUM OF ACCULTURATION AMONG THE ALEUT [1]

JAY ELLIS RANSOM

NO ONE can say just how long after the Russians arrived in the Aleutian Islands that the idea of transcribing Aleut in Russian phonetics occurred. By the time of Ivan Veniaminov (1828-'38),[2] the first and best known Russian priest to be sent to this region, many of the Aleuts were more or less fluent speakers in the Russian language, and had already been introduced to the Russian Orthodox Church and to the Bible.

Veniaminov is thought to have devised the present Aleut alphabet, although he may have drawn on less known forerunners. At any rate, credit is due him for assiduously developing the script and bringing it into active use wherever the Church and the Russian traders penetrated. He built up in his churches the best possible means for the perpetuation of written Aleut long after Russian governmental influence had been superseded by that of the United States.[3]

It may have been the constant use by the Church—whose religious works were soon translated into Aleut[4] for use in the regular services together with Russian, as is done yet today, and which had to be read by native Aleut "readers" trained by Venia-

1 The observations and comments presented here are based on contact with the Umnak and Unalaska Aleut, living on islands of the Fox Island group (latitude 53°-54° N, longitude 166°-169° W). Ethnologic and linguistic material secured in 1936-37 was further supplemented by information gained from Artie Ermelov (Umnak Aleut) in Seattle in 1940.

The phonetic system used in this paper for Aleut words and in the transliteration of Russian follows the recommendations of the American Anthropological Association for the Transcription of American Indian languages (*Phonetic Transcription of Indian Languages*, Smithsonian Miscellaneous Collections, vol. 66, no. 6, 1916).

2 Bishop Nicholas, *The Life and Work of Innocent, the Archbishop of Kamchatka, the Kuriles and the Aleutian Islands, and Later the Metropolitan of Moscow* (San Francisco, 1897).

3 The United States purchase of Alaska from Russia for $7,200,000 occurred in 1867. Russian customs, language, and churches still wield considerable influence and flavor in the coastal regions of Alaska, particularly in the Aleutian area.

4 See bibliography of Aleut publications at the end of this article.

minov for such work—that made written Aleut acceptable to the island populace. Or it may have been some other influence at work in the culture which facilitated its spread over enormous geographic areas, to be taken up and used by thousands of native Aleut speakers.[5]

It is of particular interest to note the use to which the native Aleut puts his most civilized accomplishment. Writing has had a profound psychological influence on the daily life of the inhabitants of the Aleutian Islands, wholly apart from contact with the Whites. It is as if a new invention, acquired by cultural diffusion, had awakened a non-literate people to a realization of what the wealth of their own culture could be made to mean to them and to their descendants.

An Aleut native today approaches the writing of the simplest sentences with a keen delight in his penmanship and a ceremonial flavor of ritual necessary to its completion. He is recognizably like a young American boy playing at codes and ciphers—writing by the light of a candle in a vacant lot cave the while his "gang" crouches in the shadows intent on the mystic symbols being recorded. Except that what the Aleut writes may be the day-by-day diary of his life, a letter to his friend, or a Church order to be posted on the village bulletin board. It is the symbolic and mystical attraction of writing that has been the contributing factor in its spread throughout the region and the principal cause of its perpetuation throughout an ever increasingly dominant American overlordship.

We may understand how the half-ceremonial attitude toward transcribing Aleut arose in a consideration of those who use it most. Writing is basically male property. Instruction in reading and writing is passed down from father to son, or more commonly from uncle to nephew,[6] a man to his anáqisaχ[7] if male.

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5 It is estimated that originally there were between forty-five and fifty thousand Aleuts when Vitus Bering first penetrated the region in 1743. In Veniaminov's time they numbered about 15,000, and today there are probably less than 2,500, mostly mixed bloods.

6 Whether a man's nephew was the son of his sister or of his brother was not indicated by Veniaminov in his *Zapiski ob Ostrovakh Unalashkinskago Otdiela* [*Notes on the Islands of the Unalaska District*] (St. Petersburg, 1840), and I failed to inquire when at Umnak in 1936-1937.

7 Each person may have three anáqisan (singular, anáqisaχ). An anáqisaχ is the individual or individuals into whom the soul or spirit of a deceased person enters

In the Church only men can become readers. Before America took over Alaska, each Russian church contained a school in which reading and writing of both Aleut and Russian were taught. It appears that only boys attended,[8] perhaps thereby accounting for the sole use of the written medium by the masculine element. This does not imply that women could not learn to use it. No barrier of tabu was put upon their use of script. Women could and sometimes did learn to read and write their own language. In general, women still leave such matters to their men-folk, who carry on most of the external activities of the village.

During the rise of American influence in the Aleutian Islands the control of the Russian church, with a gradual decline in vigor, passed from Moscow to San Francisco. The school as a part of church work practically ceased to exist. Nevertheless, written Aleut continued to be taught, more often in the sib unit than in the church, and, despite the unthinking disapproval by Government Indian Service employees, managed to survive with undiminished strength. In some ways it actually expanded. At Umnak the written language developed a full fledged wigwag code of inde-

on death. The anáqisax̣ is identified in life with the person whose soul will enter it and the two must be treated identically. Thus, A has three anáqisan, B, C, and D. These three may be of either sex and of any age, but of no closer blood relation than first cousin. The parents of A must treat B, C, and D just as they do A since A's spirit upon his death will pass into them. One's anáqisax̣ must eat the same things he does, dress something like him, wear his hair in identical style, and emulate his mannerisms as far as possible. No adult will spank a child who is his anáqisax̣, because it would in effect be spanking himself, nor would a man scold his grandson, because he might be scolding his own grandfather in the person of his anáqisax̣.

Any person, whether native born Aleut, or a white person married to an Aleut, may possess an anáqisax̣. Unfortunate is the individual who has none. Vera Ermelov, white woman married to Artie, also had three anáqisan (in 1936 at Umnak, Alaska), one a three month old child, another a middle-aged woman, and the third a twenty-four year old girl. (The disposition of Vera's anáqisan since her divorce from Artie in 1941 is not known to the author.) One nineteen year old Aleut matron has no anáqisax̣ (1936).

A person and his anáqisax̣ share common nicknames. General terms of endearment derive from this custom: atáta means father, but it also means being an anáqisax̣ for somebody's father; anána, or aná, mother, means also an anáqisax̣ for somebody's mother. These terms may also serve as a greeting to one entering the house. (Information collected on Umnak Island, Nikolski village, by Barbara Ransom, 1936.)

8 See Bishop Nicholas, *The Life and Work of Innocent*, for reference to the first Russian school for boys in Alaska.

pendent evolution following the undoubted diffusion of the idea from the American Coast Guard.[9]

Now that the Russian culture is principally a nostalgic memory to the present-day Aleuts, some of the mystical attitude toward writing their native language carries over to the writing of Russian. Since use of the Russian language is dying out and only the older people still understand the Russian church services, its vestigial use is mostly of a ceremonial nature. Therefore quite a considerable distinction is made between the writing of Russian or Aleut, and writing English.

English is today the business language, the medium of the local trader whose bookkeeping methods are wide open secrets to observing Aleuts. English is the language forced upon the children in the village school, and the only language permitted within the government buildings. Every child must learn to read and write English from the age of five up, and the copy book combines with unfamiliar foreign words in preadolescent years to prejudice youngsters against the use of English in later life. Likewise the reading and writing of English is taught equally to boys and girls so that there is no particular prestige attached to the ability to utilize written English. One learns it because he must.[10]

An Aleut writer transcribes English, poorly spelled because he tends to write it phonetically as he would Aleut, as a means to an end, not to express himself, though in speech he may be as fluent as the local trader. But he writes Aleut with delight and a thorough enjoyment. He will take extraordinary pains to compose his sentences correctly. Like writers in other languages, he tends to use older, more respectable terminology—the language of literature—and has in the utilization of writing developed a literary style quite different from the phraseology of mythological narration, yet in keeping with the free-flowing sound rhythm of speech. Under the

9 Jay E. Ransom, *Aleut Semaphore Signals* (American Anthropologist, vol. 43, pp. 422-427, 1941).

10 Exceptional cases arise to confound the chance probability that Aleut youngsters will become *helluo librorum*. Such cases occur quite often. Whether fortunate or not, these youngsters are transported to boarding school (Wrangel Institute) outside their own culture boundaries. Thereafter for many years the English language and American mores become the dominating influence in erasing the memory of their ancient island culture.

influence of writing, rhetorical composition develops, because what one writes will be read exactly as written by some other person. Therefore it must be morphologically and psychologically correct. The best writers, those denominated such by consensus, may utilize semi-obsolete words, phrases, or idioms, but in a straightforward manner. Elaborate periphrasis has not yet had time to develop, and it may never.

Since the only background of printed literature readily available to the general population consists of translations from Biblical works, simply written Bible stories composed by early-day priests and the like, and such works are primarily devoid of ornate phraseology, the sentences of today show a similar straight-to-the-point simplicity. Adjectives occur only as plentifully as they would in speech. Diminutives, augmentatives, and temporal aspects are frequent since the thought-aspect of the language is vitally concerned with these features, more so than any European language.[11]

The Biblical literature is thoroughly familiar to every adult male, who has usually read and reread most of the published Aleut books. So well is this material known that for almost any given obsolete word the investigator might stumble across and cite, the native informant can pick up one of the religious works and immediately find the word with added connotations of text material beyond his own immediate knowledge to help him explain. Such religious information might well be expected to manifest itself in the daily writing of the natives. So it does, for nearly every letter and diary perused by myself—and these run into the score, by several different native authors[12]—contain references to the Russian Orthodox faith. These letters in translation are curiously reminiscent of those written by early Americans two centuries ago when religious faith was a supreme power in daily life.

The complete abstraction of the written word as a symbol standing *for* a substantive or an act does not appear to be entirely clear

11 The number of such suffixes, exclusive of those denoting reiteration, is approximately 39 percent of all the suffixes in the language, a total of 57 out of 146. These do not include inflections.

12 Ardelion Ermelov, Afenogin Ermelov, Sergei Savorov, Alex Chercasin, Gregory Kochergin (Priest), Alex Krukov, and others, all of Umnak, Alaska.

to the Aleut writer. To him, almost, the written word *is* the object or the act for which nominally it stands.[13]

When the writer puts down together on a slip of paper the symbols which spell out a word, in his mental process the written word has become the external object. It seems to be a civilized manifestation of a dimly remembered Eskimo belief that every inanimate object possesses a spirit capable of performing acts detrimental or beneficial to himself. In this way he feels that he is able to control the external object to a greater extent than by physical manipulation.

Subjectively the adult native feels that symbolism is akin to truth; that abstraction is really actuality.[14] This feature of Aleut writing makes self-expression more forceful and exact than might otherwise appear. Obscenity and swearing, the former by reference to body parts and the latter by means of augmentative suffixes indicating an extreme condition, appear frequently in Aleut writing, not as features to be disapproved, but as matter-of-fact material over which no shame is felt.

Words of double meaning—one straight forward, the second bearing an obscene connotation—are treated in the light of a joke, just as in speech, except that the association between the written word and its connotation is as close as with its denotation, and both exceed that of verbal language.

As a medium through which acculturation may modify behavior, writing tends to exert a restricting influence, though without doubt a powerful one. Because of its religious origins and the intensive use made of written Aleut by the Russian churches, it would logically be expected that the dominant effect which writing would contribute to the culture would be one of a religious nature.

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13 The native holds the objective difference between the form of the written word and its appearance as an object of substantial material in his hands to be of little importance. He knows as well as we do that the object baidarki (Eskimo kayak) only can be paddled in the water, whereas the word cannot, but his emotional manifestations show the same degree of change when confronted with the solid object as by the written word. This degree of non-generalized association appears to be somewhat greater among the Aleuts than among European peoples, probably due to the more recent and mystical acceptance of the written language.

14 An analysis of the language would appear to bear this out, since abstract terms are wanting, and no demarcation line separates substantives from verbs. Deverbatives and denominatives are interchangeable forms, and the only verb, as such, is the root for being or existence (a–, to be).

One can today only surmise the extra-religious lines which writing might have formed in the early era of its introduction. One can safely assume that under ordinary conditions, the dominance of the Church would confine writing instruction and thought processes connected with writing wholly to religious doctrine.

If one considers the frequent reference to the printed religious works in the daily writings of present-day natives, divorced from Russian rule more than two generations, the whole acculturation process resulting from the introduction of writing and its acceptance by the populace must have been severely restricted for a long time to this field. Any literary material produced by native writers would hardly be published by the Church, since funds for the publication of anything Aleut would necessarily be expended solely on religious topics, particularly Biblical translations. Also considerable expense must have been involved, as well as time, even to publish the Aleut Gospels.

What literary material is available today in the islands is modern material, unpublished and unconcerned with other than daily life matters. It exists, of course, only in the notebooks, letters, and diaries, and in stories recorded in the handwriting of their owners.[15] A few ancient songs have been recorded, without any indication of their accompanying musical cadences, by Bishop Veniaminov, and published in his grammar of the Fox Island tongue.[16]

The Christian religion, as interpreted by the Russian Orthodox Church, then appears to have been the primary acculturation product directly due to the introduction of writing. This has curiously affected the aboriginal beliefs and customs in that present-day natives attempt to rationalize their beliefs by Biblical references concerned with what, to them, are similar cultural factors.[17]

15 See, e.g., Jay E. Ransom, *Wreck of the Umnak Native* [by Afenogin Ermelov, translated from the Aleut by Reverend Gregory Kochergin] (Alaska Sportsman, vol. 7, no. 2, Ketchikan, Alaska, Feb. 1941).

16 I. Veniaminov, *Opyt grammatiki Aleutsko-Lisjevskago Jazyka* (St. Petersburg, 1848) [Grammar and dictionary of the Unalaska dialect]. A translation and revision exists in German by A. Pfizmaier, *Die Sprach der Aleuten and Fuchsinseln* (Sitzungsberichte, Philosophisch-Historische Klasse der Kaiserliche Akademie der Wissenschaften, vols. 105-106, Vienna, 1884). An incomplete translation in French can also be found by Victor Henry, *Esquisse d'une grammaire raisonnée de la langue aléoute d'aprés la grammaire et le vocabulaire de Ivan Veniaminov* (Paris, 1879).

17 See footnote 7. The belief in anáqisan is rationalized through the Bible as a manifestation of the Holy Trinity, because God is presumed to have two anáqisan.

The furtherance of Christianity has not been the sole product of acculturation through writing. Its expansion into the field of everyday life has been relatively slow to develop, but once it passed out of the influence of the Church into profane affairs, its growth has been steady. Again a surmise is about all that we can bring to illumine the break away from religious doctrine. We know that such a break was truly a great one, something seldom accomplished by a primitive people with a Church-devised written language.

That a people can learn to read and write their own language, through a knowledge of written English, or in the Aleuts' case, Russian, does not imply that they have learned to turn their own spoken language into written form, especially where words are long and laborious spelling must be performed. Writing has often remained solely as something produced by an alien people for the furtherance of doctrine, not as a tool used by the community for its own multifold uses. To read a sentence is a far different proposition from writing down a thought.

Among the Aleut, where the whole life of the community gradually came to center about the Russian Church, writing had a chance to break away from restricted doctrinal usage through the custom of the priest issuing ukases, manifestos, or simple bulletins of communal information for transmittal to the whole community. These bulletins were posted on some centrally located bulletin board protected from the elements by a wooden hood, and sometimes by cleverly fashioned swinging doors.

The aboriginal economy of the Aleut villages closely resembled that of the Eskimo, whence it anciently stems, in that ownership of slaughtered game, implements necessary for securing food, etc., were shared equally by the entire community. Prior to White penetration, the Aleuts dwelt in large communal house-units instead of in individual family groups owning their own sod barabaras[18] or present-day frame houses. Anything affecting the community interest would come to be made public through a general announcement, today metamorphosed into the conspicuous bulletin board.

18 A barabara is a semi-underground sod dwelling constructed of driftwood timbers and (or) whale ribs, sodded over with the heavy grass sod common to the Aleutian Islands. The entrance, which today is an ordinary door set between heavy timbers in the four-foot thick wall, originally was in the center of the roof and from it a thick pole notched for steps led to the floor.

Ukases originating in the Church, probably concerned with specific festive dates, perhaps came gradually to include anything needing communal intelligence. Today the bulletin post is the most important feature in the community. On it are posted as required the bulletins of the Church, the Church-sponsored organizations of the Brotherhood and the Sisterhood,[19] notices sent out from the United States Commissioner relating to fishing practices, the control of liquor, etc. Even regional laws may be posted, when the chief or one of the Brotherhood, or the priest, has had time to translate such material into Aleut and interpret the Americans' code. Whatever is deemed important for the community as a whole, by one organization or the other, may be posted.

When the writing of Aleut diverged from the Church to include all community activities, and several organizations had their hands in formulating ukases, opportunity was presented for the passage of the reading and writing concept out of pure religion to the field of generalized human activity. From this, it would be logical and natural for the individual writer of bulletins, the "secretary," to initiate letter writing, diaries, and any of the many uses to which writing is put today. At least we must surmise that something of this kind occurred.

Once the idea of writing has been divorced from a restricted adherence to one field, the common man can make use of its potentialities. This the Aleut men have done.

If the first product of acculturation is religious furtherance, the second is social intercourse. From earliest aboriginal times the Aleuts have been sea rovers traversing immense regions, trapping on this island, fishing from that, gathering roots and berries on yet

19 These are expressions of an organizational sex dichotomy devoted to social and community activities which served as "Orders" to which all members of the community belong in one capacity or another. The Brotherhood probably owes its origin to the aboriginal kashime (men's house), closed to females. Boys are initiated into the secrets upon arrival at puberty. The modern Brotherhood supplies the chief, by popular vote, a secretary and a treasurer (although few actual funds are handled), and a truant officer to see that small children attend school. Other duties of the organization are to determine the seasonal curfew hours, depending on the hour of sunset, at which no children are permitted abroad in the village without parental supervision, to maintain correct "sun time" by which all native timepieces are regulated instead of the white man's radio controlled clock system, and various minor police, garbage disposal, and clean-up duties. The Sisterhood probably developed through Church influence to supplement the activities of the men.

some other favorably situated island. In modern times they have been transported by one or another of the two governments which controlled their activities, over still larger areas, scattering parts of families from Attu to the Pribilov Islands, Kodiak Island to Moscow and St Petersburg in Russia, to Bristol Bay, Seattle, and San Francisco. An occasional Aleut has even journeyed to New York.

The advent of the white man and trading brought into being regular trade routes and a system of mail distribution, unofficial in regions lying beyond regular mail routes, but a regular part of transportation facilities over recognized sea lanes.

Correspondence has been a unique development among the scattered Aleuts, and among many of them it has become highly developed. Writing in his own language, the native Aleut feels free to express his innermost thoughts, for though the local trader is often the postmaster, and given surreptitiously to opening the natives' personal mail, no trader has managed to learn Aleut.

It is deemed most humorous to write a derogatory paragraph with an obscene connotation about the trader, especially for his benefit should he open the letter enroute through his office. The fact that it would be in Aleut, and unintelligible to him, detracts not at all from the humor but rather adds to it, for the written word is the *sine qua non* of actual existence.

The writing of private diaries perhaps grew out of letter writing. During the trapping seasons, the men usually live for months alone on distant islands where letter writing is out of the question due to lack of transportation. Here a letter might be begun and continue with daily entries, properly dated because an Aleut's time consciousness is exceptionally developed through the existence in his language of a great variety of temporal morphemes[20] with which to deal with the specific activities of the day. Thus a diary may develop.

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20 For example:

–ʒu– simple futurity	–laɣana– quite a while ago
–ʒuka– futurity	–qali– inception of an act
–ɣi– duration of an act	–qaɬta– very recent past
–ka– recent past time	–naɣ.naɣ– forever and ever
–ku– present time	–liɣ.li– while, during
–qa– time long past	–saɣu– now, not long ago
–na– completed action of recent past	–xta– present action
–ma– at this precise moment	–txa– long past time

The average Aleut hunter keeps a diary for two principal reasons: first, to occupy himself in the evenings when time hangs heaviest, and second, to leave a record of his catch and of his activities should some accident erase him from the scene. The diary is to advise his relatives about his fur catch in case the trader, in his trip after the trappers, should take advantage of his death to steal some or all of his furs.

Also the major and minor events of his solitary existence leading to an untimely end would yield some inkling to his relatives of its causes. It might offer some clue to interested persons as to whether his spirit, as an asχáδaχ (Outside Man),[21] would be of good or evil inclination toward living people, an important consideration in every death. Murder, suicide, and insanity occur frequently enough to warrant such careful recording of events. The principal concern of an Aleut is for the mental welfare of his family.

Lastly, writing has served as a medium of communication by flag signaling, or waving the arms through standardized positions representing letters of the native alphabet, as the Boy Scouts of America do in their wigwag code.[22]

The ability to write their native language has injected into the family of almost every native an atmosphere of study and a delight in the realm of the mind. Although his reading must be more or less restricted to the printed volumes of religious material, his writing may conform to anything passing through his thoughts, and what one can write will directly affect the reading of some other person.

Nearly every family possesses several Aleut books which are carefully kept with pride, together with publications in Russian. Nothing that is written in Aleut is thrown away, and the attic "treasures" of some families are a marvel of odds and ends of letters, notes, diaries, printed material, ukases, receipts, etc.

Preoccupation with writing materials and books has caused the more pedantic of the Aleut men to set aside a corner, a chest or other convenient container, as a "study," where such materials may be stored and his notebooks kept. It is this *sanctum sanctorum*, the

21 An asχáδaχ, or Outside Man, is the spirit of an Aleut who has died, usually by drowning. It is given to playing practical jokes on living persons, annoying them, inducing accidents and bodily harm, throwing rocks at people from high bluffs, etc.

22 On the development of the semaphore code see Ransom, *Aleut Semaphore Signals*.

inner altar of the family, around which revolves the circle of his religious life, his correspondence, and his daily records.

It seems desirable to list here known publications in Aleut:

Shayashnikov, I. *Gospel of St Mark, Unalaska, 1860* (unpublished Aleut manuscript in the author's possession).

Shayashnivietov, I. *Kratkoje Pravilo dlja Blagotcestivoj Zhizni* (New York, 1902).

Tikhon, Bishop *Gospel of St Luke* (New York, 1903).
Gospel of St John (New York, 1902).

Tizhnov *Gospel of St Matthew* (St Petersburg, 1848; in Kodiak Aleut).

Translator unknown *The Acts of the Apostles* (New York, 1902).

Veniaminov, I. *Ukazanije Puti v Castvije Nebesnoje* [*Guide Road to Heaven*] (Moscow, 1840, with several editions to 1899).

Veniaminov, I., and Netsvietov *Natcatki Hristianskago Utcenija* (St Petersburg, 1840, with subsequent editions to 1893).
Aleutskiji Bukvarj (separately and bound with the following: *Aδúŋinuluk Háδam Histúriyά* (St Petersburg, 1893); *Gospel According to St Matthew* (Moscow, 1848, with editions to 1896). (Published side by side with the Russian version, two columns on a page: footnoted in the Atka dialect.)

These publications may be found in the Territorial Museum library in Juneau, Alaska, in the Library of Congress, Washington, D. C., and in private collections.

Redondo Beach, California

A REVISION OF THE DATE OF THE ERUPTION OF SUNSET CRATER

HAROLD S. COLTON

IN the archaeology of north central Arizona the eruption of Sunset Crater, a large cinder cone fifteen miles northeast of Flagstaff, was an important event. The eruption not only had the direct effect of driving away the original inhabitants from about the site of the volcano but its indirect effect was much more important. Some years ago the author described these effects and showed how the fall of volcanic ash affected the repopulating of the area.[1]

This fall of black basaltic sand covered an oval area with the volcano near the western edge. This area was quite extensive, covering over eight hundred square miles between the San Francisco Peaks and the Little Colorado River, and the ash ranged in depth from over a foot near the crater to a fraction of an inch at the periphery. The effect of this ash cover was important as it formed a mulch, conserving soil moisture, preventing run-off, and it apparently made agriculture possible in a region in which previously it had been impossible except in a few small areas blessed with light sandy soil. Even today the yellow pines and the junipers in the ash fall areas grow at altitudes nearly a thousand feet below their normal lower limits.

The availability of a large area of new agricultural land precipitated a land rush, causing a mixture of many cultures. Around a nucleus of the original inhabitants belonging to the Sinagua Branch settlements of other branches can be recognized: from the northeast the Kayenta Branch (true Anasazi), from the northwest the Cohonina Branch, from the southwest the Prescott Branch, and from the south, a Hohokam settlement at Winona.[2]

1 Harold S. Colton, *Sunset Crater: the Effect of a Volcanic Eruption on an Ancient People* (Geographical Review, vol. 22, pp. 582-590, 1932); *The Rise and Fall of the Prehistoric Population of Northern Arizona* (Science, vol. 84, pp. 337-343, 1936).

2 J. C. McGregor, *Winona Village: a XIIth Century Settlement with a Ball Court near Flagstaff, Arizona* (Bulletin, Museum of Northern Arizona, no. 12, 1937); *Winona and Ridge Ruin: Part 1. Architecture and Material Culture* (Bulletin, Museum of Northern Arizona, no. 18, 1941).

Therefore, the eruption of the volcano that initiated this crisis was an important historic event, and well worthy of dating in years of our era.

When an expedition of the Museum of Northern Arizona in 1930 discovered prehistoric Indian houses buried under the basaltic ash from the cinder cone, a method of dating the eruption became possible. In a few years expeditions from the Museum had accumulated from those and other nearby sites considerable archaeological and tree-ring data; therefore, in 1935, the author suggested to John C. McGregor that he attempt to date the eruption, assembling in one report all the available information. McGregor, with a masterly handling of typology, seriation, and tree-ring dating, concluded that the Sunset eruption took place some time between 875 and 910 AD, probably in 885 AD.[3]

In arriving at his date, McGregor used the following methods: (1) he listed the excavated sites that might contribute to the time of the eruption, together with their tree-ring dates, if any;[4] (2) he made statistical studies of the pottery types from the sites, expressing the results in percentages; (3) he correlated the percentages with the tree-ring dates expressed as estimated building dates.[5] From an inspection of the table that he prepared, he concluded that the eruption took place between the time when N.A. 1920B, with an estimated building date of 875 AD, was constructed, and the time that N.A. 1680, with an estimated building date of 910 AD, was built. He chose the interval between the occupation of those two sites because the earlier site, N.A. 1920 (two miles from the crater) was covered with an unbroken layer of ash, so must necessarily be pre-eruptive, while N.A. 1680 (five miles west of the cinder cone) had no ash cover. The absence of ash over N.A. 1680 is the crucial factor in McGregor's date.

When McGregor made his study, many of our common pottery types had not been recognized and described, nor had statistical

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3 John C. McGregor, *Dating the Eruption of Sunset Crater* (American Antiquity, vol. 2, pp. 15-26, 1936).

4 *Ibid.*, Table 1, p. 17.

5 *Ibid.*, Table 2, p. 21.

studies been carried out on a large scale.[6] Besides, in the past decade, many additional sites have been excavated and thousands of sherds identified by type and their numbers tabulated. In the interval, McGregor also dated many other sites by the tree-ring method.[7] Incorporating this new information with the old makes a revision of the date of the Sunset eruption seem desirable.*

In reviewing the data on the sites that have a bearing on the date of the eruption, it has been found convenient to separate the sites into three categories for the purposes of study:

1 Twenty-six excavated sites buried under undisturbed layers of Sunset ash and lapilli, with dates, if any, and their essential complex of pottery types (see Table 1).[8]

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6 As McGregor did not name the pottery types in his paper, but referred to them by symbols, the correlation with the names used in the present paper are as follows:
Kana-a Gray was referred to by McGregor as Coil I and Coil II
Coconino Gray, as Coil III
O'Leary Tooled, as Coil IV
Tusayan Corrugated and Medicine Gray, as Coil V
Kana-a Black-on-white, as Black-on-white Ia, Ib, II, IIIa, IIIb
Black Mesa (Deadmans) Black-on-white, as Black-on-white IVa and IVb
Sosi and Flagstaff Black-on-white not distinguished, and referred to as Black-on-white V

7 McGregor, *Winona and Ridge Ruin*, p. 18.

8 In the tables only those types are listed that have a bearing on the date of the eruption. A full list of all types found on these sites will be found in a paper now under preparation.

The sources of tree-ring data are as follows:
A. E. Douglass, *Central Pueblo Chronology* (Tree-Ring Bulletin, vol. 2, p. 29, 1936).
Southwest Dated Ruins, V (Tree-Ring Bulletin, vol. 5, p. 10, 1938).
John C. McGregor, *Additional Prehistoric Dates from Arizona* (Museum Notes, Museum of Northern Arizona, vol. 5, no. 3, 1932).
Dating the Eruption of Sunset Crater (1936, see footnote 3).
How Some Important Northern Arizona Pottery Types Were Dated (Bulletin, Museum of Northern Arizona, no. 13, 1938). [Cited as 1938a.]
Southwest Dated Ruins, III (Tree-Ring Bulletin, vol. 4, p. 6, 1938). [Cited as 1938b.]
Winona and Ridge Ruin (1941, see footnote 2).

* In my original work in 1936 on the date of Sunset Crater, all the facts then available were considered, and the most likely date suggested by the data was selected. As has been clearly pointed out in the present paper by Colton, subsequent research has accumulated additional data bearing on this subject, and has resulted in a suggested revision of the original dating. A large series of sites bearing on this question has been excavated in the intervening period, and much intensive work, including extensive statistical studies, has been accomplished in ceramics.

It should be made clear in the light of all this additional information, that the

TABLE 1

Sites with complete ash cover: ceramic complex and dates*

N. A. Sites	Ceramic Group	Number of Sherds: Kana-a B/W	Deadmans B/R	Black Mesa B/W	Tusayan B/R	Dogoszhi and Sosi B/W	Citadel Poly.	Sunset Red	Estimated Building Date, AD	Latest Dated Beam, AD
1653A	3	68	8	0	0	0	0	0		
1653B	3	6	3	0	0	0	0	0		
1918	3	5	0	0	0	0	0	0		
1925A	3	19	8	0	0	0	0	0		
1925B	3	38	1	0	0	0	0	0	860	859
1926A	3	16	0	0	0	0	0	0		
3024	3†	0	0	0	0	0	0	0		
1570A	4	36	2	3	0	0	0	0		
1633	4	13	1	3	0	0	0	0		
1919A	4	11	0	6	0	0	0	0		
1920B	4	10	6	8	0	0	0	0	875	860
1922A	4	4	10	0	0	0	0	0		
1922B	4	2	1	5	0	0	0	0		
1927A	4	37	17	6	0	0	0	0		
1942A&B	4	9	10	8	0	0	0	0		
1975	4	8	10	33	0	0	0	0		
3028	4	1	0	13	0	0	0	0		
3029	4	33	7	65	0	0	0	0		
3056	4	35	12	41	0	0	0	0		
1570A	5	0	51	438	0	0	0	0	1050	1046
1570B	5	0	1	1	0	0	0	0		
1570C	5	0	0	1	0	0	0	0		
1570E	5	0	0	7	0	0	0	0		
1570F	5	0	0	5	0	0	0	0		
1571A	5	0	2	9	0	0	0	0		

* Sources of tree-ring data: Site no. 1925B, Douglass, 1938; Site no. 1920B, Douglass, 1936, 1938; Site no. 1570A, McGregor, 1938a, 1938b.

† Five sherds of Kana-a Gray.

writer agrees to the necessity for a revision of the date of the eruption into more recent time—John C. McGregor.

2 Sites outside the area of deep ash, with ceramic complexes similar to the latest pottery complexes observed from under the ash with tree-ring dates (Table 2).

3 Earliest dated sites on which basalt-tempered Sunset Red pottery has been found (Table 3).

TABLE 2

Sites with tree-ring dates, situated out of the area with deep ash, and with the same pottery complexes as the latest of those that have a definite ash cover.*

N. A. Sites	*Ceramic Group*	*Kana-a B/W*	*Deadmans B/R*	*Black Mesa B/W*	*Tusayan B/R*	*Dogoszhi and Sosi B/W*	*Citadel Poly.*	*Sunset Red*	*Estimated Building Date, AD*	*Latest Dated Beam, AD*	*Latest Dated Beam, AD*
862	5	0	300	287	38	0	0	0	1060	1060 + X	1061
1238	5	0	25	19	0	0	0	0	1070	1066	1066
1244B	5	0	0	20	0	0	0	0			821†
1625B&C	5	0	12	16	0	0	0	0	950	1045 + X	855
1680	5	0	201	224	0	0	0	0	910	909 ± 10	909 ± 10
2001A&B	5-6	0	18	6	2	0	0	0	975	1008	965

* Sources of tree-ring data: Estimated building date, McGregor, 1938a: Latest dated beam, 1st column, Douglass, 1938; second column, McGregor, 1938b.

† In 1932 McGregor published a date of 948 AD for this site, but he omitted it in 1938. The date 948AD agrees with the ceramic evidence while 821 AD is too early. McGregor recently wrote the author that the piece of charcoal dating 948 AD was sent to Douglass and cannot be located. He thinks that the 821 and 948 AD dates are not true outside dates.

In the present study, special attention must be focused on five pottery complexes, indicated by decorated pottery manufactured by members of the Kayenta Branch. Since this group occupied territory immediately northeast of the Flagstaff area, these types are intrusive in the sites under discussion. Sunset Red was the only critical type manufactured locally. The pottery complexes essential to this study are as follows:

Ceramic Groups 1 and 2, indicated by Lino Black-on-gray, are too early to be considered in this study.

Ceramic Group 3, indicated by Kana-a Black-on-white, and usually associated with Deadmans Black-on-red and Kana-a Gray.

Ceramic Group 4, Kana-a Black-on-white, Black Mesa (Deadmans) Black-on-white, with Deadmans Black-on-red. This group is a mixture of the types in Groups 3 and 5.

Ceramic Group 5, Black Mesa (Deadmans) Black-on-white and Deadmans Black-on-red.

Ceramic Group 6a, Black Mesa (Deadmans) Black-on-white and Tusayan Black-on-red. No Sunset Red or Deadmans Black-on-red.

Ceramic Group 6b, Black Mesa (Deadmans) Black-on-white, Tusayan Black-on-red, Sunset Red. Often sherds of Sosi and Dogoszhi Black-on-white are present.

TABLE 3

Earliest dated sites with Sunset Red: certainly post-eruptive*

N. A. Sites	*Ceramic Group*	*Kana-a B/W*	*Deadmans B/R*	*Black Mesa B/W*	*Tusayan B/R*	*Dogoszhi and Sosi B/W*	*Citadel and Tusayan Poly.*	*Sunset Red*	*Earliest Dated Beam, AD*	*Latest Dated Beam, AD*
2133A	6	0	0	25	0	0	2	42	1071	1086
2133B	6	0	0	25	0	0	0	32	1077	1077
2133D	6	0	0	35	3	0	0	5	1079	1097
2134A	6	0	0	61	6	0	1	23	1100	1127
2134E	6	0	0	142	30	1	0	678	1071	1108
2135C	6	0	0	117	8	1	0	76	1003	1096
3644J	6	0	0	16	0	3	5	70	1092	1092
3644K	6	0	0	52	14	0	0	261	1076	1115
3644P	6	0	0	8	1	1	0	12	1100	1100
3673R	6	0	0	60	4	0	0	217	1075	1077

* Sources of tree-ring data: McGregor, 1936, p. 21; 1941.

McGregor did not distinguish Deadmans Black-on-red from Tusayan Black-on-red, or Sosi Black-on-white from Flagstaff Black-on-white. The pottery types listed above are all described in the *Handbook of Northern Arizona Pottery Wares*.[9]

Of the twenty-six excavated sites that were covered by an unbroken sheet of Sunset ash and lapilli, seven belonged to Ceramic Group 3, twelve to Group 4, and six to Group 5. Ceramic Group 6 was not represented at any of these sites. Of the six sites of Group 5, McGregor was able to date three timbers from one, N.A. 1570A, reporting dates ranging from 941 AD, to the latest date of 1046 AD.[10] In 1936, McGregor gave only an estimated building date of 1050 AD. It would seem, therefore, that the eruption took place after 1046 AD, about the end of the time that Ceramic Group 5 was in vogue. Turning to the dated sites with Ceramic Group 5 which were outside the area of the ash fall, we note from the table that the two latest sites were N.A. 862, Medicine Fort, with the latest date 1061 AD, and the nearby pithouse, N.A. 1238, with a late date of 1066 AD. Summing up, we have the following late dates from sites with Ceramic Group 5: 1046, 1061, and 1066 AD. Therefore, the eruption could have occurred after 1066 AD.

Medicine Fort is not a pure Group 5 site, although 46 percent of the 628 decorated sherds from the site belong to the type Deadmans Black-on-red, the indicator of Group 5; yet 6 percent Tusayan Black-on-red sherds were present, the indicator of Group 6. At site N.A. 1238A, with a late date of 1066 AD, out of 300 decorated sherds no sherds of Tusayan Black-on-red were found. Neither were Tusayan Black-on-red sherds found on sites with a complete ash cover. Therefore, the eruption probably took place just after the transition from Ceramic Group 5 to Group 6.

Sunset Red is a local type tempered with basaltic ash from Sunset Crater, so must have been manufactured after the eruption. It is a notable fact that among the thousands of sherds studied from

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9 Harold S. Colton and Lyndon L. Hargrave, *Handbook of Northern Arizona Pottery Wares* (Bulletin, Museum of Northern Arizona, no. 11, 1937).

10 The individual beam dates from McGregor records are as follows:

Beam F.2434—outside date 1046 AD, inside date 1009 AD: estimated cutting date 1046 plus X (from floor of house).

Beam F.2435—outside date 1041 AD, inside date 1000 AD.

Beam F.2436—outside date 941 AD, inside date 843 AD.

sites with Ceramic Groups 5 or earlier, not a single sherd of Sunset Red has been found. If we turn to the table and observe the earliest tree-ring dates from sites with Sunset Red, we will note them as follows: 1003, 1071, 1075, 1076, 1079, 1096, and 1100 AD. Consulting McGregor's[11] original tree-ring data from these sites we note that while he dated fifty-four timbers, that timber he dated 1003 AD was the only one earlier than 1071 AD. I, therefore, conclude that the timber with the date of 1003 AD was a reused beam from an earlier site. If this explanation is acceptable, then the eruption *must* have taken place after 1046 AD, and certainly before 1071 AD.

Before we can accept these dates, finally, we must mention certain facts which seem to conflict with the data—the absence of an ash cover over Group 5 sites in Medicine Valley, which was a critical factor in McGregor's conclusions; and the absence of cinder-tempered Sunset Red in six Group 6 sites in the same area, and certain differences in the tree ring record in the Flagstaff area. That no Sunset ash was found in any Group 5 sites in Medicine Valley might be brought up as an objection to the new date of the eruption. In answer to this it must be recalled that Medicine Valley lies from four to six miles northwest of the crater, and that the prevailing winds are westerly, southeast winds being rare in the Flagstaff area, so the principal area covered with ash lies east of Sunset Crater, both northeast and southeast. At the present time the ground in Medicine Valley shows no ash cover, nor have any dunes of ash been discovered in the valley. In that area two Group 3 sites, certainly pre-eruptive, have been excavated, and no ash was encountered in the excavation. On the hills between Medicine Valley and Sunset Crater, about three miles from the vent, several Group 5 sites were excavated. Two of these sites showed pockets of Sunset ash above the floor. From seven other nearby sites no ash was reported. It seems pretty clear that during the eruption of the cinder cone, the wind was seldom from the southeast, and that Medicine Valley was too far from the crater to have received much ash. The little ash that fell became mixed over a period of years with the alluvial soil of the valley, so the absence of ash from site N.A. 1680 and other Group 5 sites does not necessarily mean that they were post-eruptive.

11 McGregor, *Winona and Ridge Ruin*, p. 18.

TABLE 4

Group 6 sites in Medicine Valley with no evidence of basalt-tempered Sunset Red or Deadmans Black-on-red

	Plain Wares				*Decorated Types*						
N. A. Sites	*Alameda Brown Ware*	*Tusayan Gray Ware*	*San Francisco Mt Gray Ware*	*Total Number of Utility Sherds*	*Black Mesa B/W*	*Tusayan B/R*	*Dogoszhi and Sosi B/W*	*Citadel and Tusayan Poly.*	*Source of Tree-Ring Dates*	*Estimated Building Date, AD*	*Latest Dated Beam, AD*
192B	10%	25%	64%	355	41	42	1	0	Douglass 1936		925
									McGregor 1938b		925
408A	39%	31%	33%	1175	13	20	16	3	Douglass 1936	975	976
									McGregor 1938b		908 + X
1554A	72%	14%	14%	485	7	13	26	0	McGregor 1932		832
2002A	0	24%	76%	100	8	1	1	1	Douglass 1938	1120	1114 ± 6
									McGregor 1938b		1115
2004B	59%	0	41%	670	4	58	59	5	Douglass 1938	950	950
									McGregor 1932	860	
Total				2785							

The absence of the pottery type, Sunset Red, from 2785 sherds out of six Group 6 sites in Medicine Valley (see Table 4) must be explained, because twenty-nine excavated Group 6 sites near Winona, twelve miles south-southeast of the crater, showed Sunset Red sherds in considerable quantities. In the Medicine Valley area, four of the sites have beams dated much earlier than from any other Group 6 sites. We might explain this discrepancy by the hypothesis of re-used beams. The absence of sherds with cinder temper on these sites is harder to explain, but it might be accounted for in two

ways. First, all the sites except N.A. 2002A might be pre-eruptive, the eruption taking place very early in the time that Group 6 was in vogue; or, second, as the sites all lie on a cultural frontier, the utility type, Sunset Red, was not one of the traits belonging to the cultures represented. This was certainly true of two of the sites, which definitely belonged to the Cohonina Branch, with San Francisco Mountain Gray Ware as the utility ware. On Site N.A. 1554A, Alameda Brown Ware, the ware of which Sunset Red is a type, supplied 72 percent of the utility sherds, and still there was not a single sherd of cinder-tempered Sunset Red among 485 plain sherds excavated from the site. I might mention in this connection that one Group 6 site at Winona, N.A. 2133G, had no sherds of Sunset Red out of 85 utility sherds. It is possible, and very probable, that cinder temper was not used immediately after the eruption, and that in the early years when Group 6 was in vogue, the experiment had not been made, and that the use of cinder temper came in gradually, beginning in the Winona area, and later spreading to other nearby regions. The absence of cinder-tempered sherds on certain Group 6 sites does not seriously interfere with the acceptance of a new date for the eruption of Sunset Crater.[12]

If a date between 1046 and 1071 AD is selected as the time of the eruption, instead of between 875 and 910 AD, it would explain a number of facts that previously were difficult to fit into the picture. (1) We could now accept the dates from N.A. 1570A, dates of 1041 and 1046 AD, which McGregor omitted from his study because at that time he, as well as the author of this paper, felt that the timbers were probably intrusive. The notes show the site to have had a complete ash cover though with some disturbance such as might have been caused by the uprooting of a tree, and also the dates are in perfect accord with the ceramic data from the site. (2) With the new date before us, we now believe that the Indians used Sunset ash as

12 In order to approach directly the problem of dating the eruption, the author assumed that the Bonito Lava Flow from Sunset Crater might have entered a forest of yellow pines similar to that growing in the area at present. If the flow had entered such a forest, one would expect to find charred timbers at the end of the lava flow. Acting on this hypothesis, in 1939, he instructed Mr Milton A. Wetherill, who was assisted by five men of the Civilian Conservation Corps, to excavate to the old ground level, at a number of places at the end of the lava flow. Although the party worked for about six days, and moved a quantity of cinders, no timbers were discovered and the search was discontinued.

a tempering material a few years after the eruption, instead of waiting 185 years to make the experiment. Nor should we forget that out of thousands of sherds sorted from excavated Ceramic Group 5 sites, not a single sherd of Sunset Red has been reported. (3) In earlier papers,[13] the author reported that a land rush into the Black Sand area occurred after the eruption. At the time he realized that the migration took place while the type Black Mesa Black-on-white was in vogue, and set a date halfway in the period, about 1000 AD. We now know that the migration came at a time when Black Mesa Black-on-white was associated with Sunset Red, toward the end of its period of popularity, between 1070 and 1100 AD. Thus the land rush into the area covered with the fall of Sunset ash took place soon after the volcano quieted down, and not a hundred years later. (4) Seventy-seven timbers have been dated by McGregor from the pueblo called Wupatki. Almost all of these were complete timbers showing the whole circumference, not bits of charcoal. Thus the inner ring indicates, in most cases, about the date the tree started to grow. The greatest building period of the pueblo seems to have been from 1120 to 1140 AD, and most of the timbers cut before 1140 AD started to grow after 1070 AD. This suggests that a new forest of yellow pine sprang up after the fall of ash, and that these trees were utilized by builders of the pueblo. (5) A later date for the eruption would make more credible a historical background for a Hopi legend associated with the destruction of the pueblo of Pivahongkiapi.[14]

Considering all the available data, a new date for the eruption of Sunset Crater, a date between 1046 and 1071 AD, seems to fit more of the facts than the older date between 875 AD and 910 AD.

Museum of Northern Arizona
Flagstaff, Arizona

13 Cited in footnote 1.

14 H. R. Voth, *Traditions of the Hopi* (Publication, Field Columbian Museum, no. 96, Anthropological Series, vol. 8, 1905), p. 243.

IDEA AND ACTION PATTERNS IN NAVAHO FLINTWAY

LELAND C. WYMAN AND FLORA L. BAILEY

INTRODUCTION

ONE of the crucial theoretical problems of anthropology is the extent of correspondence between idea patterns and action patterns. But most discussion of this subject has taken origin from general impressions or sheer speculation. Professor Boas and others have pointed out the need for empirical data upon which generalizations might be based. A rather remarkable opportunity for examining this question arose when Father Berard published an extraordinarily complete text and translation of the *Origin Legend of the Navaho Flintway* (1943: hereinafter referred to as FW) together with numerous ethnological notes. No part of this material was based upon the observation of behavior but was obtained verbally from his informants, so it consists entirely of idea patterns. Before this monograph appeared we had witnessed and made detailed notes upon two complete performances of Flintway. Since two of us were making records we managed to keep the patient, singer, and most other personnel under continuous observation during the ceremonials. Moreover, the singer volunteered frequent explanations throughout both chants, and Miss Maud Oakes attended one (performance II; *vide infra*) and aided us in recording later impressions. Besides we had witnessed three other performances of the chant and numerous excerpts or *preliminaries* (FW p. 39). In addition, one of us had participated as the patient in a performance of Female Shooting Lifeway (Wyman, 1936), and enjoyed a long acquaintance and many conversations about the ritual with several Lifeway singers. We possessed, therefore, a considerable body of data, partly of idea patterns but mainly of records of objective behavior, i.e., action patterns. This paper offers a digest of these latter for comparison with the idea patterns presented by Father Berard.

In addition to the question of parallelism between action and idea patterns, our data in conjunction with those of Father Berard bear upon a different though related problem, that of the stability of patterns transmitted by word of mouth. The assemblage of

behavior patterns which constitute a Navaho ceremonial are learned, to be sure, as much by behavior as by word, but they are codified for oral transmission in an assemblage of idea patterns. It was a happy circumstance that the singer of the two chants which we followed intensively, our principal informant B, was a former apprentice of Father Berard's principal informant SC, the native author of his "version A" of the Flintway legend. The performances which we witnessed were carried out in a region about one hundred miles distant from the locale of Father Berard's informants and none of the participants came from the areas in which he has worked intensively. The only connection, therefore, between our data and his was via oral transmission of idea patterns in the teacher-apprentice relationship of SC and B. From time to time over a period of eight years B had told one or both of us fragments of the Flintway origin legend, which put together corresponded amazingly well with the running accounts of Father Berard's informants. Moreover, during this time B had imparted many explanations of details of behavior, corresponding to Father Berard's "notes" (FW pp. 12-55). We have checked these with our informant DS, and had the benefit of notes taken from PP and TL by Dr W. W. Hill (see Wyman, Hill, and Ósanai, 1942, p. 10 for status of his and our informants). Dr Clyde Kluckhohn has kindly supplied us with cross-checks from two informants (Kb—male, 77 yrs, clan 37, widowed, non-acculturated, singer [Blessing], resident at Ramah; Ks—male, 84 yrs, clan 37, non-acculturated, singer [Blessing, Enemy, Male Shooting], resident at Stony Butte) and with notes taken by Dr Harry Tschopik on the final night of a Flintway sung by a practitioner from Two Wells, over a patient at Ramah, July 5, 1937 (all localities mentioned are in New Mexico unless otherwise designated).

All our material, from the same or different singers in different years, and in different parts of the eastern Navaho country, is amazingly uniform, in fact so much so that no differences striking enough to be mentioned, other than the meagre number to be found below, are in our field notes. Our data likewise resembles Father Berard's so exactly that the few variations or additions which we are able to present serve to emphasize likeness rather than disparity.

Dr Hill (1939) has commented on the stability of the religious

aspects of Navaho culture. The resistance to change and the resulting preservation of myth and ritual insures those latent functions of ceremonialism which have been so ably discussed by Dr Kluckhohn (1942, p. 66 ff.), namely "fulfilling the expectancy of the familiar," reaffirming and heightening "awareness of the common system of sentiments," thus helping to maintain a feeling of security, or at least lessening anxiety. No doubt these functional aspects reciprocally reinforce the propensity for stability.

LIFEWAY RITUAL

Lifeway ceremonials are specific for the treatment of injuries (Wyman and Kluckhohn, 1938 [hereinafter referred to as WK], p. 30; FW pp. 7-10, 272) and may be employed as emergency or first aid measures (*preliminary singing*, FW p. 39). They are conducted according to lifeway ritual, a major division of the grand trichotomy which governs Navaho ceremonials, *viz. holyway, ghostway (evilway), lifeway* (see Wyman, 1944, p. 365; we differ with Father Berard who postulates a dichotomy, FW p. 41). Flintway is the fundamental *lifeway*, and Shootingway has borrowed from it to form lifeway branches (Wyman, 1936; WK p. 6; FW pp. 14, 28, 43, 44). Only the female branch of Flintway is commonly practised today. Father Berard could not find a singer competent to relate the legend of the male branch (FW pp. 4, 7) and our informant B had seen it only once. DS claimed that there is a singer of it at Ramah and another at Two Wells. B and DS said that it differs from the female branch only in songs, some medicines, the headplume, and face painting, and that the same equipment may be used for both.

THE TYPE PERFORMANCE[1]

The chants will be described according to the method of Kluckhohn and Wyman, 1940 (hereinafter referred to as KW), Part I (examples—Parts II-V).

The type performance occurred at Pinedale, at the home of the singer (B), July 11-13, 1941. Any differences in the details of an-

1 The other three performances of Flintway which we have seen were sung by B over MN (B's older wife), July 29, 1938 (sacro-iliac strain from fall); by B over FM, July 4, 1942 (appendicitis operation two months previous); by TJ over FL, July, 1938. We have also seen numerous *preliminaries* conducted by B, TJ, or other singers; and a Female Shooting Lifeway sung by BD over B's sister.

other performance (II) conducted by B at GK's home, Bison Springs, July 18-20, 1941, are given preceded by II, in parentheses immediately following the description of each procedure. If no differences are listed it may be understood that the procedures in the two performances were identical. The few differences listed emphasize the similarity of the two ceremonials, so the following records exemplify remarkable uniformity in the ceremonial behavior of one singer in different performances of the same chant.

Etiology

According to B, his mother-in-law (MM) had "bad eyes, bloodshot, almost blind." A singer from Smith Lake sang Flintway over her twice, seven or eight years ago, but she improved and then relapsed after each chant. B sang Flintway for her about six years ago and she has been all right ever since. She had been thinking about "putting up" the fourth performance to round out the series, so she took advantage of our offer to help finance it. (II. 11:00 AM, July 16, 1941, GK came to ask B to sing over his older wife [GKW], who had suffered eye trouble since viewing an eclipse of the sun in 1940. After consulting B, who was singing Chiricahua Windway about ten miles distant, GK received B's bundle from EN [B's younger wife] and returned home.)

Personnel

The status of most of the personnel is given in Wyman and Bailey, 1943b, p. 12. P*—patient (MM, clans 1, 2, 3, 4; II—GKW, clan 28). S—singer (B, clans 17, 20). A—assistant (JM, young male, clan 43; II—JK, GK's younger bro.). BH—bath helper (OW, S's mo.; II—EN). OM, CM, FM (P's sons); MN, EN, JY (P's daughters); AY (JY's husband); WS (EN's cross-cousin); JB. Children: PN (S's son); AS, GY, DY (JY's children); EH; TH (S's sister's grandson, 7 yrs). (II—GK, S's cross-cousin, clan 22; WB, S's cross-cousin, O's son; TJ; U.) B learned Flintway from three singers —his maternal uncle O, a singer at Mariana Lake named for clan 17, and S.C. WB gave him O's Flintway equipment (see FW p. 28).

* These abbreviations—P, S, A, BH—are used throughout this paper for these principal participants—Editor.

Preparation

In the evening of July 10, AY, JY, her three children, MN, PN, went by automobile to trade for a kid with AY's parents at Mariana Pass (because their livestock had not been dipped). The kid was slaughtered and MN proffered a basket in trade but after some discussion it was returned, "because it was too much; she should get two kids for it; wanted to trade some kids instead" (AY). The patient and women of the family cleaned out the ceremonial hogan in the afternoon of July 11. One calico spread with S's bundle behind it was placed at the west side. Three hoof rattles were borrowed from TJ because earlier in the afternoon B had loaned two of his three to a woman from near Standing Rock for S. C. to use.

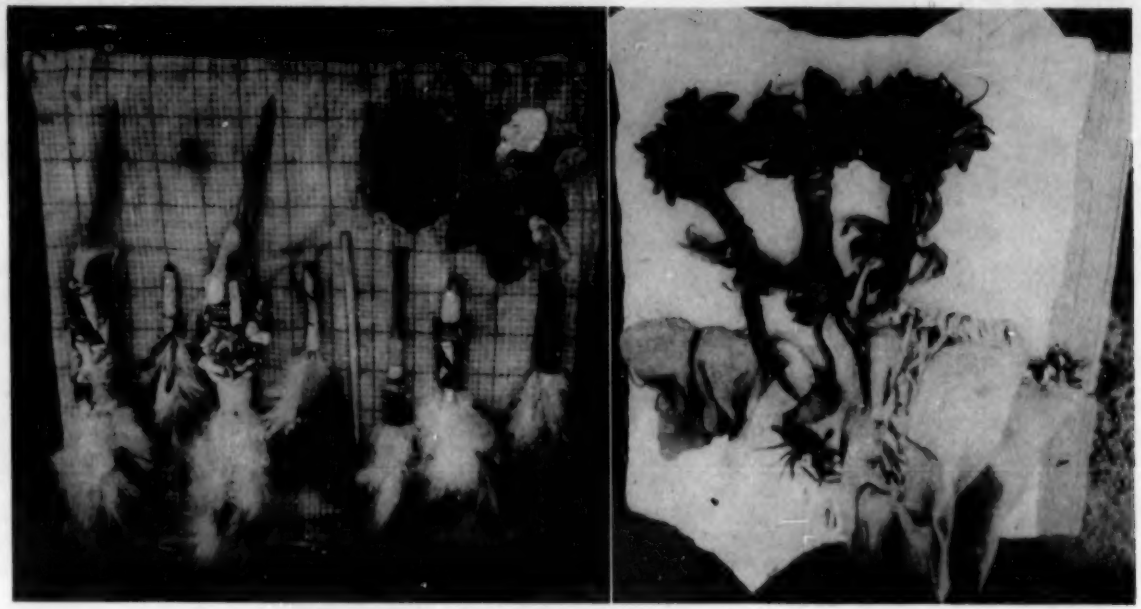
Expenses. Fees for singer: ten dollars the first night, fifteen dollars the final night. Five dollars for food from the trading post (flour, sugar, coffee, bread, etc.), one kid *(vide supra),* and one goat.

Equipment

Detailed descriptions of Flintway equipment have been published so we will add only a few variations concerning certain items.

Cranebills. The sandhill crane figures prominently in the legend, songs, and prayers of Flintway (FW pp. 22, 117-121, 171-176, 245-261) and a pair of cranebills are the specific and most important item of the pouch, comparable to the bundle prayersticks of Holyway chants (KW p. 25). Nevertheless, substitutions are permitted; the heads of other species, e. g., heron (L.C.W. once obtained a pair of great blue heron heads for B; see FW pp. 22, 28); herbs, e. g., earth medicine roots dressed in beads (KW p. 108; FW pp. 37, 275); or the pouch of Shootingway (FW pp. 234, 275). If the roots are substituted they must be undone and put away in the shade where animals cannot bother them before they get too dry (DS quoting his maternal greatgrandfather). If Shootingway equipment is borrowed the arrows may not be used nor held by the patient during the dawn songs (B; FW pp. 14, 234, 275; Wyman, 1944, p. 365; observed, TJ singing over FL).

The cranes were clubbed by riders on fast horses, early in the morning (TL, PP). The neck, lungs, heart, breast meat, and



INFORMANT B's FLINTWAY EQUIPMENT
as laid out for a male patient

"urine" were removed, sun-dried, and strung together through holes bored through them and wrapped up (TL); pieces of the tongue, windpipe, lungs, heart, and of all other organs in order down to the anus, were placed on a stick to dry and later put in the big reed in the same order (PP; FW pp.22, 231-234), together with medicines and arrowheads or sand occasionally found inside the crane (TL). Live eagle plumes, four feathers from each wing of the crane and four tail-feathers were attached to the skin of the neck to represent the wings and tail of the bird (TL, PP; each feathered item, except the headplumes, of B's pouch also had one or two blue macaw feathers and all male items had four bluebird feathers). A little piece of everything that is inside the body was dried in the shade, some plants were sprinkled on it a bit at a time, and when this was put in the cranebill it "made the bird alive again; it's got body and everything in it" (DS).

Canes. These have been called *digging sticks* (Wyman, 1936, p. 627; KW p. 31) and are symbolic of such implements (FW p. 19). In B's pouch for the type performance the smooth cane was entirely undecorated, and B said it was made of hard oak and was the male. The feathered member of the pair (made of mountain mahogany—B) *did* occupy the female position in the chants *(vide infra).* This is opposite to all other accounts and to our previous observations and no explanation of this apparent reversal could be obtained.[2] In TJ's pouch and in the one used by B in 1938 both canes were decorated with feathers ("but one is a smooth cane"—B).

Medicine sprinkler. The small brush of sandhill crane's feathers for sprinkling life medicine on the patient (FW p. 32) was missing from B's pouch, but SC showed us his and TJ also had one *(vide infra).*

Medicine. B described ʔazeʔ taʻhicéʻh ("medicine, it is plunged into water"), a life medicine for "heart, lungs, measles." "It prevents them: dangerous to children; heart not strong enough to stand it." To make this medicine certain black beetles are caught on

2 Could there be a connection between this "reversal" of the sex symbolism of the canes and the fact that B was singing over his mother-in-law? B does not observe mother-in-law avoidance and has told us that he had "fixed it up a long time ago" (cf. Reichard, 1936, p. 266).

sandhills and held under water in a basket for about an hour. Then they are liberated. "It is strong like chili pepper, comes out your nose." Kb said it is used for serious injuries or "when a baby is born broken up," and that the patient has to eat "long red worms."

The *growing stone* (concretion or a fossil) is buried with some life medicine plants an inch or two deep beneath a bedridden sufferer from a protracted, chronic illness. He must lie on them until the plants grow up through the earth (the stone makes them grow). Then the plant is transplanted to the east outside. If it grows the patient will recover. Growing stones are scarce and expensive; few singers have them. They are found around Chin Lee, Arizona (DS).

The spread layout. In Plate 2, B's equipment appears as laid out for a male patient, male item of each pair first, i. e. to the left of the female item. For a female patient the order is reversed (FW pp. 23, 37). The order (as shown in Plate 2) from left to right (west to east or north to south in a ceremonial) is male cranebill, male headplume (called *chant token* in KW p. 37), female cranebill, female headplume, smooth cane, feathered cane, male and female medicine stoppers, turtle shell cup and nine flints above these ("If I had four large flints, black, blue, yellow, white, I would not have to carry all these"—B), three hoof rattles, three little bags of life medicine (male, female, live; see Wyman and Harris, 1941, p. 67), one of sour red ochre (Wyman and Bailey, 1943a, p. 11; FW p. 37), and pouch below rattles. The smooth cane is first and the feathered cane bears a white shell bead, thus substantiating B's contention as to their sex *(vide supra)*.

TJ's layout (singing over MN) was quite different. From west to east (tips north) were male medicine stopper, male headplume, male cranebill, medicine sprinkler, female cranebill, female headplume, female stopper, male cane, female cane (both had feathers), three rattles, turtle shell cup north of center, little medicine bags at southwest corner, flints at southeast corner. Since the patient was female it is apparent that TJ considered the east the leading position whereas in B's arrangement *(vide supra)* it would be to the west. We have not seen the symmetrical arrangement of the first seven items in other performances.

Short Singing

Although FW (pp. 218, 281) states that on the day before the *one night ceremonial* the singer arrives and "simply spends the night there (without singing)," a short singing ceremony took place on the first night of all performances that we have seen. This current practice has led to such chants being called "two night" rather than "one night" ceremonials (WK p. 31; KW p. 106).

Preparation. 8:00 PM—P and S entered the ceremonial hogan. The sponsor (L.C.W.) put part of the fee (ten dollars) beneath the spread (FW p. 281, "putting below"). Women of the family brought blankets for seats, a pail of water, and built a fire. FM brought headband for S and the borrowed rattles. 8:15—S made spread layout on its canvas wrapping and the calico spread, tips north (toward P), with the female member of each pair of items first (i. e. west of the male). "Tips will be pointed east on the final night" (S). Save for the sex reversal the order was as in Plate 2, except that both headplumes were east of the medicine stoppers and the flints were south of them. There were four hoof rattles. S ate a pinch of sour red ochre and gave one to sponsor. 8:30—S washed turtle shell cup, half filled it with water, put in a pinch of life medicine from each of the three bags, and placed the female cranebill across it, tip north. (II. 8:30 PM—S made layout and prepared medicine.)

Singing. S asked sponsor to choose one of three groups of songs: Thunder, Monster Slayer, or Holy Young Man. Sponsor chose Monster Slayer songs.[3] 8:40—S began to sing, shaking a rattle. FM, CM, and AY shook the other rattles. S gave the sandhill crane's call after each song (sound symbolism). This was a sharp, high-pitched, trilled, "p-r-r-r-r-t" (not "dó·d dó·d" as in FW p. 117). 10 songs. Pause while S related part of Monsterway (this was for sponsor's benefit, not a regular procedure). 5 songs. Pause; S stirred medicine with female cranebill and tasted the tip twice, reversing tip and butt ("sunwise") between tastes. S stood before

3 Branch (preliminary) songs (KW pp. 64-67; FW pp. 39, 44) are selected according to the sickness (B). The same set must not be repeated in succeeding chants; some of each of the three must be selected for one chant or the three sets are rotated in successive ceremonials (B).

P, turtle shell cup in right hand, female cranebill in left, and during song 16 administered the medicine four times, holding the cranebill beneath the cup with its tip toward P as he moved the cup to her mouth and swinging it so its tip pointed north as she drank. 3 songs. Pause. 3 songs; during songs 20, 21, 22 S jingled flints occasionally ("people hear flints jingling as Monster Slayer returns" —S; see FW pp. 40, 131, songs 20-23 which mention flints). 3 songs, ending the set (25 in all) at 10:10 PM. "All are shaft songs [see FW p. 44]. Tomorrow night we will leave out some of them" (S; 15 were sung). S folded ends of spread over layout and left it in place ("until tomorrow night"—S). 10:05—P left the hogan briefly and returned to sleep. Women brought food and coffee. Spectators dispersed to sleep. (II. 8:32-9:35—27 Holy Young Man songs. Medicine administered four times during 14th.)

Spectators. AY, FM, CM, OM, EH, AS, GY, OW, MN, JY, DY.

BATH

FW pp. 15, 54, 218-222, 225-229, 275-279, 281-282.

Collection of materials. 8:15 AM—By S, to the south, with white flint. 8:30—OW ground yellow corn, at northeast, and put meal in turtle shell cup which S placed in front of layout. 8:40—JY brought sand in blanket for platform. 8:45—MN brought bath basket and paper package of pollen which S placed in a little bag. (II. 9:02 AM —EN brought sand, basket, and water; OW moved P's bed; S sent girl with turtle shell cup for corn meal. It has been noted that this singer [B] has collected the yucca root himself in all chants conducted by him which we have witnessed, both Flintway and Navaho Windway.)

Platform made. 8:50—basket placed, water and yucca root inserted. 8:55—song 1 ("Holy Young Man songs"—S). Sound symbolism after each song excepting the Blessingway songs (*vide infra*). (II. 9:06—9:17).

Making suds. 9:00—song 2. P undressed. Song 3—BH whipped up suds. (II. 9:25).

Suds design. 9:10—frost medicine, sparkling rock, blue pollen, cat-tail pollen, three kinds of medicine, corn pollen. (II. 9:36—blue pollen, live medicine, two kinds of medicine, cat-tail pollen, corn

pollen. P undressed.) FW: the order given is medicine, blue pollen, flag (cat-tail) pollen, corn pollen, medicine; but strewing of medicine at the bottom is omitted except for a helpless invalid (p. 282).

Suds application. 9:12—song 4. WS and daughter (*ca.* 10 yrs) entered. (II. 9:40—song 4: "Buffalo songs"—S.)

Bathing. 9:17—9:28—songs 5, 6. (II. 9:45—9:52).

Disposal. 9:28—by JY, with meal. (II. 9:52—with pollen.)

Meal application. 9:35—song 7. S applied meal to the four house posts (this is the only *consecration of the hogan* performed in Lifeway ceremonials; hard oak twigs are never used). (II. 9:55.)

Pollen administration. 9:39—song 8 (Blessingway song, no rattle). Three men entered. Song 9, with rattle, during communal pollen prayer ("the last of Holy Young Man songs"—S). P dressed. Two men entered. 9:50—song 10. 9:55—P went to shade. Men rested in hogan; women went to shade to prepare lunch (goat meat stewed with chili peppers; broiled goat ribs, intestines, lungs, liver; hot tortillas; store bread; coffee). (II. 10:00-10:20—songs 8-10; P left hogan.)

Spectators. MN, EN, JY, GY, AS, DY, EH, TH, WS, WS's daughter, AY, PN, FL, four other men. Rattles shaken by PN, GY, AS, TH (children); later by EH and a man.

Songs. There were seven songs preceding *pollen administration,* one Blessingway song during it, and two following. S said that there were four groups: Gila Monster songs, Bath songs (Suds songs), Buffalo songs, Holy Young Man songs; besides one Corn Meal Cup song and one Talking God Pollen song (Blessingway). FW prescribes three Gila Monster songs of four stanzas each (placing soaproot in water, rubbing it between his hands, bathing the patient) and two Talking God Blessingway songs, one for the *meal application* and one for the *pollen application.* In the type performance *meal application* was accompanied by a special song but apparently not from Blessingway since it was accompanied by rattles. This, and the order of strewing the materials for the *suds design,* are the only details which differed from those given in FW.

THE FINAL NIGHT

FW pp. 16, 35, 40, 44, 51, 96-107, 223-224, 229, 282-284.

Preparation. 8:00 PM—sponsor put fee (fifteen dollars) under the spread. (II. 9:10 PM—sponsor [GK] brought calico spreads and handed [*sic!*] some paper money to S. 8:45—AY brought sheep tallow and red ochre. 9:00—food served. 9:27—AY placed 5 or 6 calico spreads on blanket at west. S placed spread layout on these, tips east, and rearranged it (female headplume on top of female cranebill, male headplume south of male cranebill, turtle shell cup east of male cranebill, mixed salve in horn container east of smooth cane, sheep tallow and red ochre east of rattles, flints at south end of spread). 9:35—P entered, sunwise around layout, and sat in P's place. S designated JM as assistant. ("We have to get someone to paint the patient, maybe TI. I cannot paint her. I have to sing. Have to be pretty careful"—B. "It must be someone who has had a sing like that before"—DS.) CM brought him a headband and sat beside him. A sat next to S and mixed a large ball (*ca.* 3 inches diameter) of sheep tallow with a generous pinch of mixed salve (*ca.* three-quarters inch), three powdered life medicines (live medicine last) put in by S, and red ochre ("red for blood"—B) sprinkled on by CM. A likewise prepared a small ball of red tallow (*ca.* 1 inch diameter) (II. prepared by S), and a small ball of uncolored tallow (containing sheep tallow and mixed salve only). S gave A the smooth cane to use as a spatula in mixing the tallow and to scrape his hands afterward. He started to scrape endwise with the cane but S stopped him and told him to use it sidewise. S held out the rattles while A wiped his hands on them. A applied red tallow to the tips of all objects in the layout (II. as S presented them one at a time), from north to south ("those things are alive so they have to have red ochre like the patient"—DS). P undressed and placed her jewelry and moccasins, toes east, at northeast corner of layout. (II. 9:10-9:30.)

Body painting.[4] By A, P standing on end of spread. 9:45—song 1. S, CM, JB, and a boy shook rattles. Sound symbolism after

4 "If patient is very sick cannot have body painting. Sing and put cat-tail pollen on chin and sparkling rock on face. Paint is too strong. After patient gets well have Flintway" (B; cf. FW pp. 275-281).

each of First songs. 9:51—song 2—uncolored tallow spotted in ceremonial order, on hairlock, on mandible. Song 3—body painted red with large ball of tallow. Songs 4, 5—face painted with small ball of red tallow. 10:02—song 6—mixed ("thunder") charcoal applied to mandible, right to left (FW p. 52).[5] Song 7—sparkling rock, two spots on each cheek, right first, outside spot first on each (FW p. 46; TJ over FL—spot on nose also). (II. 9:30—song 1. One song with application of each ball of tallow; thus song 5 was Charcoal song and 6 the Sparkling Rock song.) Remnants of the three balls of tallow, the bag of thunder charcoal, and that of sparkling rock, passed among female and male spectators, from west to east in each case, while they applied the materials to themselves corresponding to the applications on P.

Headplume tying. Song 8—A thrust the headplume towards P's head in ceremonial order, and tied it tip forward to her hairlock. (II. 10:05—song 7.)

Sanctification of moccasins. S handed rattle to a boy (S did not shake rattle after this) and put buffalo track dust in P's moccasins (FW pp. 18, 283).[6] Song 9—P donned jewelry and moccasins. P and S resumed seats at end of song 9. (II. Song 7—headplume tied; P and A resumed seats at end of song 7, 10:05; songs 8 and 9 followed.)

Preparation of medicine. 10:15—song 10. 10:24—song 12; S placed turtle shell cup on mound of dirt east of layout, squatted in front of it, held a pinch of *female medicine* above the cup, moving it up and down in time with the singing, and then strewed it across the water in the cup from west to east and back with sound symbolism. S likewise strewed *male medicine* from south to north and back, and *live medicine* around the cup sunwise, then placed the

5 After the restoration of the hunter "he could not talk, so thunder came down around his mouth, that black, made him talk" (B). "If patient has been struck by lightning use cat-tail pollen on chin and cheeks instead of thunder charcoal and sparkling rock. Thunder charcoal would bring back the lightning trouble" (B).

6 That genuine buffalo blood (FW p. 17) and buffalo track dust are still preferred to the substitute is attested by the appeals of B and D to L.C.W. to obtain some for them. Fortunately this peculiar assignment was fulfilled by a visit to the yard of an Oklahoma establishment where bison from a private herd were slaughtered for meat.

female cranebill across the cup, tip east (FW p. 32).[7] 10:30—song 15. 10:44—song 17; S squatted before medicine cup, held the female cranebill slantwise with the tip toward the west side of the cup and beat time with it, then drew its tip through the medicine from west to east and back twice with sound symbolism. S likewise drew lines from south to north and back, and around the cup sunwise, pointing the tip of the cranebill straight down toward the center of the cup while beating time before this last maneuver. S stirred and tasted the medicine with the cranebill *(vide supra)*. "Song is story of man and mountain sheep" (B). (II. 10:10—songs 10-14; song 12—Coyote's song. Song 15—S drew lines in medicine.)[8]

Administration of medicine four times. 10:47—song 18 *(vide supra* for method), S dumped remnants on top of P's head; replaced cranebill in layout and cup east of it. (II. Song 16; cranebill replaced across cup.)

Application of cranebills. Song 20; both cranebills applied in ceremonial order at seven points (feet, hands, breast, back, each shoulder, top of head), twice at each reversing tip and butt south to north (tip south first) with sound symbolism; the whole series four times. Song 21 followed. (II. Songs 17-19. 10:45—songs 20-21 followed.)

Administration of dry medicine. S gave two bags (female and male medicines) and the canes to A, and instructed him. 10:55—song 22; A gave P dry powdered medicine twice at signals from S (FW pp. 224, 280; "whenever the song came upon words with which medicine is to be given, he administered it"), female medicine twice first, then male medicine twice. The feathered cane was used as a spoon for the female medicine, the smooth cane for the male, tip and butt reversed between spoonfuls. A gave P a cup of

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7 "Supposed to use medicine stoppers once in a while (TJ over FL and MN—did use one). I used them the first time I sung over her (MM). The second time used the *real one,* the crane head. Man see mountain sheep; see tracks up bluff; jump in those tracks; drop bow and arrow right on top of water; that's those things (medicines strewed on water)"—B (see FW pp. 57-58, 104).

8 TJ over FL—S also prepared cold infusion of four bundles of large roots placed in ceremonial order in a Pueblo bowl which P drank from at intervals throughout the night; B over MN—cold infusion of *arrow killer* (helianthoid *Compositae*) leaves and roots.

water to drink and resumed his seat. (II. 10:50—song 22. Song 23 followed ["Gila Monster song"].)

First songs ended. 11:00—P, accompanied by A ("to protect P from ghosts"—DS), left the hogan and returned immediately. (II. 10:55.)

All night singing. 11:00-11:55—27 Thunder songs. During songs 1 to 3 S rested and smoked, while A shook a rattle and led the singing, and during song 4 S left the hogan briefly. Five men and two women left. During song 20 S told P to put on her blouse. 11:45—song 24; two men and two women left. During the last song S administered dry medicine, female and male twice each as before. (II. 10:56-11:50—25 Thunder songs: song 8—"four darknesses"; 13—"Fighting struck him, cyclone"; 14—"sky, mountain, earth"; 17—"spider"; 20—"Woodpecker" [S]. S jingled flints during songs 1-3, 12 and 13. During song 4 S left hogan briefly. During song 15 [11:28] A gave dry medicine once.)

11:55 PM-12:10 AM—8 Crane songs. P left briefly during song 7. S gave medicine during the last. Pause while JY and EN served coffee. (II. 11:50 PM-12:12 AM—9 Crane songs; 7th—dry medicine by A.)

12:14-12:50—15 Monster Slayer songs. 12:35—song 6, S and A left briefly. Song 12—S jingled flints. Song 15—A gave dry medicine. S said that these were branch (FW—"preliminary") songs. (II. 12:12-1:00—22 Monster Slayer songs. 12:27—between songs 9 and 10 P left hogan briefly. 1:00-1:07—pause for coffee.)

12:50-12:55—4 Sun songs. (II. 1:07-1:20—6 Sun songs. During song 5 S tried to awaken A without success, so he himself gave P dry medicine.)

12:55-1:39—22 Holy Young Man songs. 1:34—between songs 19 and 20 S left hogan briefly. (II. 1:20-1:56—18 Holy Young Man songs; 10th—dry medicine by S. 1:56-2:01—3 Feathered Cane songs; 3rd—dry medicine. 2:03-2:13—4 Smooth Cane songs; 4th—dry medicine.)

1:39-2:00—11 Flint Home songs. (II. 2:15-2:37—4 Flint Home songs. Pause for coffee.)

2:00-2:25—10 Bird songs. S awakened A and gave pollen bag to P. P sprinkled pollen on DY and AS. EN sprinkled pollen on GY and PN. "To protect the sleeping children, because everyone is supposed to be awake and sitting up, not leaning against the hogan" (S). (II. 2:37-3:00—10 Bird songs; 10th—dry medicine by A.)

2:25-3:37—33 Buffalo songs; 14th—dry medicine by S. S left briefly during 15th. 2:25—between songs 20 and 21 coffee was served. (II. 3:00-3:30—17 Buffalo songs ["I am going to skip 40 or 50"—S]. S and P left hogan briefly during 13th; 15th—dry medicine by A.)

Dawn procedures. 3:37-4:10—28 Dawn songs. S standing before P administered pollen four times during first. 3:45—song 4; S squatted before layout, gathered layout together, briefly beat time with it, and handed it to P who beat time with it during the remaining songs. 4:10—during last song S took layout from P and thrust its tips toward her five times, in ceremonial order, with sound symbolism, then thrust it toward spread in ceremonial order, with sound symbolism and laid it in a bunch on spread with sound symbolism. (II. 3:30-4:30—28 dawn songs. Song 14—S administered pollen. Song 18—S gave layout to P.)

4:12—S collected rattles. P arose and A stood before her with pollen bag. Blessingway song; A applying pollen, untied headplume and replaced it in layout. "Headplume untied in ceremonial hogan in Flintway, outside hogan in Female Shooting Lifeway" (S). A applied pollen to P's hairlock, mouth, and top of head, and made trail to door. P left hogan to "breathe in the dawn" (B). 4:15—communal pollen prayer. 4:19—song ended; S said pollen prayer and sprinkled pollen on layout. 4:20—S packed his equipment. S gave a piece of calico each to JB, an old woman (clans 20, 2), and WS. (II. 4:33—Blessingway song. Four men and six women awake. 4:37—P left hogan. 4:40—S packed equipment.)[9]

Spectators. 9:35 PM—9 females, 15 males. (II. 9:10 PM—14 females, 25 males; 3:20 AM—6 females, 11 males [5 asleep]; WB, U, TJ sang all night.)

9 TJ over FL—A disposed roots from cold infusion, keeping tips and butts oriented in a cloth.

Songs. Table 1 presents the sequence and number of songs of the song groups of Flintway as prescribed by versions A and B of FW and our informant B, and as counted in the two performances described above. Thus the first three columns represent idea patterns and the last two are action patterns. The table also illustrates the intentional omission of certain songs in some groups, or of entire sets (Cane songs, type performance; Crane or Sun songs may also be omitted–B), in order "to get through or to put in branch songs" (B). All the First songs and Dawn songs must be sung and about 17 of the Buffalo songs (see FW pp. 6, 33), but to sing all stem (shaft) songs would take about three nights and three

TABLE 1

Sequence and number of songs in the song groups of Flintway

Song Groups	*Prescribed by FW:* *Version A*	*Version B*	*Prescribed by Informant B*	*Number of Songs in:* *Type Performance*	*Performance II*
First songs	21	10	26	22	23
first song	*1*	*0*	—	*1*	*1*
tallow	*2*	*2*	—	*1*	*1*
red ochre	*2*	*2*	—	*3*	*2*
thunder charcoal	*1*	*1*	—	*1*	*1*
sparkling rock	*1*	*1*	—	*1*	*1*
headplume	*2*	*1*	—	*1*	*1*
medicine	*12*	*3*	—	*14*	*16*
Thunder	26	25	28	27	25
Crane	9	8	9	8	9
Monster Slayer	24	25	25	15	22
Sun	8	8	9	4	6
Holy Young Man	29	30	32	22	18
Feathered Cane	8	8	8	0	3
Smooth Cane	8	8	8	0	4
Flint House	12	12	12	11	4
Kingbirds	10	12	12	10	10
Buffalo	76	73	74	33	17
Talking God Dawn	0	4	0	0	0
Small Bird Dawn	28	28	28	28	28
Blessingway	6	—	1	1	1
Totals	265	251	272	181	170

or four singers (B). The discrepancy between idea and action patterns, seen most clearly by comparing the "totals," is due chiefly to the shortness of summer nights and in large part to the omission of Buffalo songs. B was aware of the number omitted while singing, for in both performances he remarked "we skip ——" after each group, and the number mentioned added to the number counted tallied exactly with the total prescribed for the set by him at another time. Versions A and B are not clear as to the number of First songs (FW pp. 96-107, 223-224) hence the discrepancy (the numbers stated may be inaccurate). The sequence employed by B is the same as in versions A and B, and the numbers of songs prescribed by him correspond with one or both versions in eight instances and, except for the First songs, differ by only a few in the other five. Only version B, however, had Talking God Dawn songs.

Ceremonial Restrictions

Instead of washing off the body paint after two or four days the patient may let it wear off, or may add more if desired (B). In the forenoon after the final night MM (P) attended a Chiricahua Windway about a mile from her home (cf. KW p. 18, P "must not leave home" for four days). See FW pp. 50, 230, 284.

PRELIMINARIES

A peculiarity of Lifeway ritual is that in emergencies, or whenever desired, singing and other ceremonies may be carried on for as long or as short a time as is deemed expedient (WK p. 30; KW p. 106). Father Berard calls such performances "preliminaries" because after the patient has recovered he usually completes the process by having a concluding "one night" ceremonial (FW pp. 24, 35, 39, 61-94, 272-281). The following exemplifies such preliminaries.

During the forenoon of July 18, 1941, preceding performance II and following an Upward-Reaching-way blackening the previous evening (Wyman and Bailey, 1943b, pp. 11, 43-44) and fumigant burning from 8:15 to 9:17 AM (Wyman and Bailey, 1944, p. 330) B sang two excerpts from Flintway over GKW. S had made spread layout, tips north, at 8:15 AM before the fumigant burning. 9:45

AM—S prepared turtle shell cup of medicine (male and female life medicine, sour red ochre) and placed a medicine stopper over it, tip north. 9:45-10:20—10 Thunder branch songs (FW version A mentions 7, and version B 11, pp. 80-82). Sound symbolism after each song. 10:20—S administered medicine four times, holding cup over medicine stopper, tip north. 3 Locust songs (not mentioned in FW). S prepared another cup of medicine (male and female), put a growing stone in it, and medicine stopper over it. 4 songs; medicine four times during last. 10:50—singing ended. S rested.

11:03—S prepared cup of medicine (with growing stone). 8 Crane songs; 6th, 11:15—medicine four times. S again prepared medicine. 8 Sun songs; 5th, 11:37—medicine four times. 4 Buffalo branch songs ("best songs"—B). 11:51—S administered dry medicine four times, using canes. 12:00—Blessingway song; pollen administration. 12:05—communal pollen prayer. P left hogan. S packed equipment. EN took calico spread to automobile and hung S's bundle on north side of hogan. GK had given S ten dollars when he arrived. "That's all they pay us; if they give more we start tonight" (B).

Stretcher. The preliminary ceremony of the stretcher may be employed when a person is injured away from home (FW pp. 48, 88). B's account was the same as that in FW with the following variations. Green life medicine is placed on it. The cranebills are laid on top of the patient. Two men take pollen and carry him. The singer walks behind, singing and shaking the hoof rattle. They stop to rest occasionally. When they reach home they continue to sing (B). If a man falls off a horse and cannot get up only a singer should go over to see how badly he is hurt; he sings, and then they take him home (DS).

ONE DAY CEREMONIAL

Although SC (FW pp. 36, 268) seemed to allow a choice between the one-night and one-day ceremonials for concluding the preliminaries and Father Berard said "in practice" this "opinion seems to be favored," B and DS confirmed C's opinion (FW version B) that the one-day ceremonial should be held only in June or July, as

determined by the "sundial" of Sun Temple on the Mesa Verde (FW p. 26; Wyman, 1944, p. 364). They also said that it is reserved for treating prolonged chronic illness. We have never heard of an actual performance, although our fieldwork has always been from June to September, and in 1941 Kb spoke of seeing *one* in the Ramah district and that *over 50 years ago*. KS said he had seen *one* in the middle of the summer. B, DS, Ks, and Kb confirmed most of the details given in FW (pp. 35-36, 48-49, 224-230).

CONSTANT REDDENING WITH MEDICINE

This five-night ceremonial (FW pp. 40, 231) is used for serious injury or chronic trouble. The singer must know both male and female Flintway, or two (three—B, DS) singers must be employed (Ks). They sing continuously, in shifts, until the final night when they sing together (B, DS). Medicine from Whirling Earth (FW p. 53; Wyman, 1944, p. 364) is needed (Ks). The singer paints the patient from feet to head with horizontal stripes, close together, using black stalk medicine and red medicine (*Lithospermum angustifolium* Michx.).

In another special treatment for serious or chronic injury the articles of the pouch are undone (see KW p. 44). B said it is done in a *constant reddening with medicine*, but Ks said it is done on the last day of a preliminary singing (maybe fifteen days). The patient, instructed by the singer, ties up the articles again so it is called ʔádił xadilné·h, "dressing by self" (Ks).

REDDENING AROUND WITH MEDICINE

This is a special one-night ceremonial for a chronic condition which has resisted treatment by ordinary Lifeway chants (B; FW pp. 41, 231). Black tallow is applied to the patient in stripes crosswise and back in ceremonial order, and red tallow likewise on top of the black (B, Ks). It is so strong a patient should have it only once a year (B).

PLACING MEDICINE

The time for the five-night ceremonial in which life medicines and sour red ochre are ground, new equipment is prepared, and old is refreshed, is set by the "sundial" of *flint home* and our informants (B, DS) agreed with C (version B, FW p. 270) that it is

November and December, rather than midsummer as stated in FW pp. 9, 26. B, DS, PP, and Ks gave an account similar to that in FW (pp. 19, 23, 31, 41, 230-244, 270) with the following variations. All Lifeway singers are notified and they gather new medicines. Flintway pouches are made on the south side of the hogan and Shootingway pouches on the north as in FW version B; version A has it opposite. The boy grinds male medicine at the southwest, the girl grinds female medicine at the northwest (B; FW version A has it opposite, p. 239). If the children have lied about being virgins the medicine will get wet, and they are dismissed and new ones are chosen (Ks). These ceremonials are infrequent—every few years (PP), once in twelve years (B). The only one we have heard about (and the only one Kb had ever heard of) was sponsored by AY's father at Mariana Pass, November 1, 1939. A singer from Black Mountain, Arizona, was employed for a fee of one hundred dollars. Ten singers participated. Twenty-five Flintway pouches, 15 Female Shootingway, and 3 Male Shootingway pouches were made or refreshed (the heron heads given to B by L.C.W. were prepared). About 300 people attended. The singer made approximately eight hundred dollars (B). B's Flintway equipment has cost him about one hundred and fifty dollars.

SHAFTWAY

The Lifeway ceremonial known as Shaftway appears to be obsolescent, for of all our informants only B had seen it recently and it was unknown to S. C. (FW p. 44). B knew of only three living singers of Shaftway: at Coyote Canyon, Crownpoint, and Cañoncito. DS confirmed the existence of the two latter and Ks knew of the first two. Of deceased singers, B knew of one at Mariana Lake, DS knew one at Ramah, and Kb knew two. Kb had not seen the chant for forty years. Miss Maud Oakes found a singer at Cañoncito who claimed to know the legend (this was probably the one known to B and DS). Father Berard (1938, p. 642) proffered the conjecture that the term Shaftway is an alternative for Flintway derived from the "main shaft songs," but later he said it probably has no connection with them (FW p. 44). The balance of evidence indicates that it is a distinct ceremonial.

B and DS said that Shaftway is according to Weapon-way

(Fighting or Injury-way) sub-ritual (FW pp. 8, 42), but Ks denied this. DS told of a patient in a Shaftway ceremonial south of Mt Taylor who was allowed to kill a deer for food after the bath because the ceremonial was Weapon-way and therefore he was immune to infection from killing and handling blood. All other Lifeway chants are according to Peaceful-way sub-ritual. In Shaftway rattles and cranebills are not used, only four "round things of little feathers" about two inches in diameter (B). Tips of articles in the layout are placed in the opposite direction to that of Flintway (B). Shaftway is not differentiated according to sex (B).

SUMMARY AND CONCLUSION

The Flintway assemblage of ceremonial patterns provides preliminary singings of any needed or desired length, two kinds of five-night chants, a one-day chant, and two kinds of one-night ceremonials. The nine-night form was traditionally prohibited (FW pp. 13, 21, 232). Preliminaries consist of singings of various lengths with the administration of medicine, and may include bath, pollen painting, stepping, application of buffalo track dust, placing pouch under garments, or stretcher ceremonies. The five-night chants are *constant reddening with medicine* and *placing medicine*. The latter comprises the following ceremonies: making pouches, fire, bathing pouches, grinding medicine. The one-day ceremonial is made up of bath, Sun pollen painting, reddening, and Sun's cake ceremonies. The one-night chants are the special *reddening around with medicine* and the common "two night" Flintway, female branch (the male branch is obsolescent). The characteristic pattern of ceremonies in the latter is *short singing* the first evening, *bath* the next morning, *reddening* and *all night singing* on the final night (short singing may occur in the afternoon). *Fumigant burning* or *prayer* ceremonies may be added to any chant upon request.

Comparison of objective behavior with legend and precept indicates that among the Navaho the correspondence between idea and action patterns is remarkably close in the realm of ceremonialism, and that orally transmitted ceremonial patterns are comparatively stable. These circumstances sustain the latent function of myth and ritual of "preserving the familiar," hence they are adjustive responses.

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THE EFFECTS OF SPANISH SLAVERY ON THE INDIANS OF THE INTERMOUNTAIN WEST

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DISCUSSIONS of slavery among primitive peoples to be found in anthropological literature have had a tendency to stress its social consequences and economic functions. For the Indians in the Intermountain West, however, there may be found reasonably detailed historical information dealing with the circumstances in which a particular system of slavery arose in sympathy with Spanish colonial practices. Two points of general anthropological interest develop in this material: first, the imitation (diffusion) of this trait of Spanish colonial culture was subjected to a re-evaluation and adaptation to native culture; and in consequence, second, slave labor among the Indians never assumed industrial proportions, slaves remaining chattels to be used in trade.

The ink was only twenty-five days dry on the American Declaration of Independence when Fray Francisco Atanasio Dominguez and Fray Silvestre Velez de Escalante, with a few companions, departed on their historic journey to the Utah Lake region and return. It was on July 29, 1776, that they left Santa Fé, New Mexico, in an unsuccessful quest of a thoroughfare to Monterey in California. Much of their journey took them through the area now constituting the states of Colorado and Utah, regions never before visited by white man.

Even though New Mexico and Arizona were known to Spaniards as early as 1540, it was not until 1776 that there was sufficient motivation to encourage a renewal of explorations on a scale approaching the first extensive peregrinations of the 16th century Spaniards. Why the delay? Apparently Spanish interest in exploration had lost much of its lure when the early Spaniards failed to discover precious minerals in this part of the New World. Spanish economy after these first thrusts into the Southwest was mainly agricultural in character.

Escalante had been preceded in western Colorado by mining explorers along the River Animas: by John Maria Rivera, who in

1761 had penetrated as far north as the Gunnison River, and by Pedro Mora and Gregoria Sandoval, who in 1775 entered the same region as Rivera. Escalante's journey, prior to his arrival at Utah Lake, took him through three main groups of Ute, all of which were centered in southwestern and western Colorado, and to some extent in eastern Utah. Another important group was located in the Utah Lake region far to the west. These were the Timpanoguitziz, or as Escalante preferred to call them, the Lagunas. South of the Lagunas there were located several other groups of Ute and Paiute which occupied the region extending down to the Rio Colorado. The region through which courses the Green River was notably lacking in Indian population, and it presented itself as a sort of barrier between the Colorado Ute and the Utah Lake Ute. The northern section of the Colorado plateau, particularly the Uintah basin, was a contested region dominated at that time by Shoshone.

The Ute in southwest Colorado had by this time become quite familiar with the Spaniards, and they were frequenting the outposts and villages of northern New Mexico. Abiquiu was once raided by the Ute in 1747, and shortly after it was abandoned, not to be reoccupied until 1754.[1] Escalante had noted mounted Ute far to the north in western Colorado, and he himself traded beads, knives, and cloth for food and information. Knowledge of white men undoubtedly spread throughout Ute territory, for the Colorado Ute were often visited by the Timpanoguitziz from Utah Lake, who would be certain to communicate such information to the Indians farther west. It is evident that the Ute and Spaniards were on friendly terms, although each viewed the other with suspicion.

Escalante's diary reveals that the Ute had hardly begun their contacts and conversions with the Indians of the Great Plains. Indeed, in 1776 the Plains Indians had just begun their own transformation into the spectacular mobile cultures known to our pioneers. In nearly all aspects the Ute were living on a cultural level comparable with their Paiute and Ute brethren in the Great Basin.[2]

After Escalante a number of adventurers wandered into western Colorado and eastern Utah seeking furs and minerals. In 1805

1 Hodge, *Handbook*, part 1, p. 2.
2 Harris, *History:* translation of Escalante's diary.

Manual Mestas was accredited by the governor of New Mexico with the feat of reducing the Ute to peace and recovering horses stolen by the "Camanches" and retaken by the Ute in subsequent battles between the two tribes. Mestas was mentioned as an interpreter of fifty years' experience, and from the account given it appears he had visited the vicinity of Utah Lake.[3]

In 1813 an expedition of seven men under Mauricio Arze and Lagos Garcia left Abiquiu, New Mexico, journeying to Utah Lake, where they remained three days, returning to New Mexico after four months traveling. For the first time is recorded evidences of slavery. Arze testified under oath that the Indians insisted on selling them slaves. When the Spaniards refused to buy, the Ute killed eight of their horses and one mule before the chief could get them under control. After this incident the Spaniards departed for home with alacrity. It is apparent that by this time the road to Utah Lake was fairly well known, both to Spanish trappers and occasional slavers.[4]

Slavery as an institution was unknown to precaucasoid Ute. What, then, were the circumstances and conditions which encouraged slavery? Ethnological data indicates that the aboriginal Ute, untouched by white man, was living on a low cultural level restricted by a very rigorous and parsimonious environment. His clothes, shelter, weapons, and other necessities were generally of the simplest manufacture, and food was scarce. The principal social unit was the extended family, although there were many occasions when members of several families would unite for communal drives, harvests, or festivities and ceremonies. Human life had a low value, and cannibalism was not unknown in times of dire stress. When Spaniards indicated their willingness to purchase or trade for slaves, the Indian, with little emotional aversion, was willing to provide the supply.

An old trapper, by the name of "Uncle Dick Wootton," who was in Utah in 1837 and 1838 remarked that it was no uncommon "thing in those days to see a party of Mexicans in that part" of the Great Basin, "buying Indians."[5] He added, "While we were trapping

3 Snow, *Utah Indians*, p. 68.
4 *Ibid.*
5 Conrad, *Uncle Dick Wootton*, pp. 75-80.

there I sent a lot of peltries to Taos by a party of those same slave traders."

Farnham wrote in 1839 of the "Piutes" and Sanpitches living in the region of the Sevier River:

> These poor creatures are hunted in the spring of the year, when weak and helpless, by a certain class of men, and when taken, are fattened, carried to Santa Fé and sold as slaves during their minority. "A likely girl" in her teens brings often £ sixty or £ eighty. The males are valued less.[6]

Elsewhere he wrote:

> The price of these slaves in the market of New Mexico varies with the age and other qualities of the person. Those from ten to fifteen years sell from $50 to $100, which is by no means an extravagant price, when we take into consideration the hurculean task of cleansing them fit for the market.[7]

From these same writings there is given an inkling of the emotions of the slave in captivity:[8]

> Notwithstanding their horrible deficiency in all comforts and decencies of life, these Indians are ardently attached to their country, that when carried into the land of their captors and surrounded with abundance, they pine away for their native desert. . . .

It might be expected that American, French, and Canadian trappers, beyond the reach of the laws of their home lands, would participate with the Mexicans in the slave traffic. There is at least one reference that shows such a practice did occur. On this matter Farnham recorded:

> The Mexicans capture them for slaves; the neighboring Indians do the same, and even the bold and usually high minded old beaver hunter sometimes descends from his legitimate labor around the mountain streams, to this mean traffic.[9]

The trapper era in the Uintah basin of Utah saw the Ute finally succeed in displacing the Shoshone in that area.

Several introductions to Ute culture resulted in a profusion of major changes in their economic life. The horse insured greater mobility and afforded a means of transportation throughout vast

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6 Farnham, *Travels*, p. 249.
7 Farnham, *Life*, p. 377.
8 *Idem*, p. 378.
9 *Idem*, p. 377.

areas. To many it meant an augmented food supply. New weapons, utensils, and numerous other articles were introduced. Portions of the Spanish language were absorbed by the Indians, and some became quite proficient in its use. Jones noticed in San Pete Valley, in central Utah, that "Some of them could speak more or less Spanish, but not enough to converse satisfactorily."[10] These are just a few of the numerous items of European derivation that were introduced to the Indians.

Slavery, to which Ute culture was already compatible, rendered it possible for those Indians with more effective accoutrements and organization to enhance their advantages while other groups became the hunted and tended to pass into obscurity. Great leaders, such as Chief Walker, commanded a considerable following roaming over large areas from Utah Lake to southern California, taking their toll of slaves and tribute. The principal area of their activities was along the "Old Spanish Trail."

The Navaho, too, raided various southern Ute and Paiute bands for slaves. These were used in their own households, and were sold to Mexicans. Palmer intimated that some Navaho raiders came as far north as Cedar City, Utah.[11] The Paiute were in the unenviable position of being hemmed in between Walker's raiders on the north and Navaho raiders who swept up from the south.

Women slaves were preferred by the Navaho, and their lot was usually better than that endured by their male compatriots. Female slaves assumed many of the duties of the womenfolk, such as herding sheep, weaving, and performing various domestic tasks. Many of them became the wives of their masters, which made it possible for them to enjoy practically the same status as any other female in the tribe. The male slave, on the other hand, was rarely accorded membership in the tribe. According to Palmer, they were compelled to suffer any indignity their masters cared to inflict, and many were sterilized so they could be left in "safety" among the women when the masters left on war parties, or on hunting and trading expeditions. Palmer also adds that some slaves had their ears cut to indicate they were in servitude.[12]

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10 Jones, *Forty Years*, p. 51.
11 Palmer, *Pahute Indians*, p. 41.
12 *Idem*, p. 40.

Death was often a penalty administered to a recaptured slave, and many escapees were pursued for days, especially if a horse, or other personal property, had been taken to facilitate the escape. There are a few stories in western literature describing the flight of captives from servitude back to their homelands.

As a pioneer in the intermountain region, Jones had first hand experience with the slave traders. He wrote as follows:[13]

> Thus we find that the people of New Mexico at the time I am writing of them, in 1851, were making annual trips, commencing with a few goods, trading on their way with either the Navajoes or Utes (generally with the Navajoes) for horses, which they sold very cheap, always retaining their best ones. These used-up horses were brought through and traded to the poorer Indians for children. The horses were often used for food. This trading was continued into lower California, where the children bought on the down trip would be traded to the Mexican-Californians for other horses, goods, or cash. Many times a small outfit on the start would return with large herds of California stock.
>
> All children bought on the return trip would be taken back to New Mexico and then sold, boys fetching on an average $100, girls $150 to $200. The girls were in demand to bring up for house servants, having the reputation of making better servants than any others. This slave trade gave rise to the cruel wars between the native tribes of this country, from Salt Lake down to the tribes in southern Utah. Walker and his band raided the weak tribes, taking their children prisoners and selling them to the Mexicans. Many of the lower classes, inhabiting the southern deserts, would sell their children for a horse and kill and eat the horse.

We have discussed the effects of Indian slavery upon those groups who profited by its tolerance; now, what about those who were decimated? Captain J. H. Simpson, in 1859, noticed that the Pieeds lived adjoining the Pahvants down to the Santa Clara, and were represented as the most timid and dejected of all the Utah bands. "They barter their children to the Utes proper for a few trinkets or bits of clothing," said Simpson, "by whom they are again sold to the Navajoes for blankets, etc."[14] In northern Nevada, north of Carson Lake, Simpson's party was offered a "lad of about 8 years of age" in exchange for a jacknife. The child's owner was said to be a Paiute.[15] The location of this attempted transaction indicates that the effects of Spanish slavery extended at least as far north as the Humboldt

13 Jones, *Forty Years*, pp. 49-50.
14 Simpson, *Report of Explorations*, p. 55.
15 *Idem*, p. 93.

River, in northern Nevada. Further information proffered by Simpson reveals that the Tosawitch were the Indians providing the connection between the Paiute, Bannock, and the Pahvant Ute who were living in the vicinity of Fillmore, Utah.[16] The Gosiute suffered considerably from the depredations of slave raider bands. Chief Walker's raiders were headquartered less than a day's ride away. Several explorers, particularly Simpson, noted that the fear of capture caused these people to live generally some distance away from water, which they brought to their camp in water ollas.[17] On the other hand, there are pioneer references showing that the Indians preferred to remain away from water holes because of "superstitions." Habitations, being simply wind-breaks made of the natural flora of the region, offered some degree of concealment from the prying eyes of depredators. One band of Paiute lost nearly fifty percent of its membership into the channels of slavery.[18]

Escalante had long ago envisaged Spanish settlements throughout the region he traversed, but in his wake there had followed Spaniards with less sedentary ideas. Colonization was finally accomplished by a religious sect of Americans who entered Salt Lake valley, in July, 1847. These were the Mormons, and their settlement insured the domination of Americans over the entire area and the attenuation of Spanish influences. Almost as soon as the Mormons arrived at the valley they were confronted with the slavery problem.

Several groups of Indians were camped near the hot springs, about a mile or two north of the Mormon settlement of Salt Lake City. According to Kimball, these Indians kept their young women and children as slaves, and sometimes treated them in a most cruel manner. The redmen were not long in "learning that the saints were a tender hearted people and could not witness such scenes without sympathizing to the uttermost with those who were being tortured."[19]

> During the winter of 1847-8 [wrote Bancroft] some children were brought to the fort to be sold. At first two were offered, but the settlers peremptorily

16 *Idem*, p. 117.

17 *Idem*, p. 53.

18 Communication in Simpson, *op. cit.*, pp. 461-462, by Garland Hunt, Indian Agent.

19 Kimball, *Our Pioneer Boys*, pp. 734-742.

refused to buy them. The Indian in charge said that the children were captured in war, and would be killed at sunset if the white men did not buy them. Thereupon they purchased one of them, and the one not sold was shot. Later, several Indians came in with two more children, using the same threat; they were bought and brought up at the expense of the settlers.[20]

In the fall of 1847 some Indians from Wanship's band appeared in the Mormon camp with two young girls whom they had captured from Little Wolf's band. Young vividly described one of these girls: "The Indians had shingled her head with butcher knives and fire brands. All the fleshy parts of her body, legs, and arms had been hacked with knives, then fire brands had been stuck into the wounds. She was gaunt with hunger, and smeared from head to foot with blood and ashes."[21] The Indians had offered her in exchange for a rifle, "but as rifles were scarce the pioneers hesitated to make the trade."[22] The Indians "began to torture the little one, at the same time declaring they would kill her unless the rifle was forthcoming."[23] A young man, named Charles Decker, parted with his only gun, took the little girl and gave her to his sister, Clara D. Young, who brought her up. The news of these transactions spread fast among the Indians and soon the market was flooded with children.

Everywhere the pattern was similar. Indians would appear in a camp with children, usually captives from other bands, and offer them for sale or trade. Refusal would bring threats of death to the little prisoners, and the pioneers would purchase them to alleviate their sufferings. This pattern, incidentally, extended into Wyoming and Idaho, where there are references to activities similar to those in vogue in Colorado, Utah, and Nevada. The capture and enslavement of women was fair game among many North American Indian tribes, but the peculiarities herein described were confined to intermountain areas influenced by the Spaniards of the Southwest.

It is evident that in the event of hostilities between various Ute or Shoshone bands, the victorious warriors would claim the women and children of the defeated as their own. It also appears that the women, together with their children, would surrender themselves peremptorily to the victors after a battle, and not wait for appre-

20 Bancroft, *History of Utah*, p. 278.
21 Kimball, *op. cit.*, pp. 734-742.
22 *Ibid.*
23 *Ibid.*

hension. This is the explanation given for the adoption of Dave Kimball, an Indian character well known to many students of Utah history. After a battle in Salt Lake valley between Mormons and Ute, under Chief Goship, the Saints were embarrassed when the women of the defeated Indians threw themselves at the mercy of the whites. A few of the children remained in adoption, among these being Dave Kimball, who was brought up by Heber C. Kimball.[24] In all probability, this practice received development after the introduction of slave trading. Bancroft has recorded two separate incidents of this nature:[25]

> On the 11th [1850] the Indians fled from the thicket to Rock Canyon, whither the volunteers pursued them . . . , but during the expedition 27 warriors were killed. The women and children threw themselves upon the settlers for protection and support, and were fed and cared for in Salt Lake Valley until spring. . . .
>
> After a desultory fight of three or four hours, six Indians were killed but none of the settlers. As was their custom, the women and children of the slain followed the victorious party to their camp.

Possibly, the Indians feared capture by Walker's men more than they did the white men with whom they had just been in bitter combat.

Sometimes, a mother would permit her child to be adopted by a Mormon family rather than see it taken by enemies and sold to the Navaho or to Mexican slavers. At least she would be able to visit the child on occasion. Some young boys preferred to live with the Mormons rather than with their own families because of the greater security they were thus afforded.

When the Mormons arrived in Utah it was Mexican territory. A scant two years later it was American. Brigham Young was the governor of the Territory of Utah, and had oversight of Indian affairs. His desire was to abolish the slave traffic. When some traders were discovered in central Utah, Young was notified and he immediately traveled some forty miles south to Provo, Utah, where the Mexicans were detained. The Mexicans presented a license to engage in the slave traffic which had been issued by the governor of New Mexico,[26] but Governor Young explained to them that the

24 Verbal statement of R. V. Chamberlin, who employed Dave Kimball as a Gosiute informant.

25 Bancroft, *History of Utah*, pp. 310, 312.

26 Most references say, "the governor of New Mexico," but one (Brooks, *Indian Relations*, p. 7) says it was signed by "James S. Calhoun, Superintendent of Indian Affairs for the Territory of New Mexico."

territory was now under the laws of the United States as a result of the Treaty of Guadalupe Hidalgo, and he could not permit slavery. He also gave them a moral lecture on the cruelties of slavery, explaining that the practice resulted in wars and bloodshed among the Indian bands.

> The Mexicans listened with respect [wrote Jones] admitting the traffic would have to cease . . . but as it had been an old established practice they were not so much to blame for following the traffic heretofore. Now it was expected that this business would be discontinued. All seemed satisfied and pledged their words that they would return to their homes without trading for children.[27]

Eight of these Mexicans did not keep their promise and remained. Their leader was Pedro Leon, and all were arrested and brought to trial. The Mexicans were found guilty and fined, but later their fine was remitted, and they were permitted to return to New Mexico. The trial, and other forms of pressure exerted by the Mormons, succeeded in breaking the organized slave traffic, but there were some violent repercussions. A few Mexicans lingered throughout the territory, inciting the Indians against the Mormons, and Walker's powerful band, once friendly, now became disgruntled. The very next year they arrived in Provo with some children for sale or trade. When sales were not forthcoming, Arapine, Walker's "brother," became enraged, saying that the Mormons had stopped the Mexicans from buying these children; that they had no right to do so unless they bought them themselves. Jones wrote that he and several other white men were present when Arapine "took one of these children (a small boy) by the heels and dashed its brains out on the hard ground after which he threw the body" toward the white men, adding that they had no hearts, or they would have bought the child and saved its life.[28] There was a later attempt by a party of Mexicans, under a certain Dr Bowman, to revive the slave trade. Bowman was killed when he annoyed some Indians, and his henchmen returned to New Mexico without the children they sought.

In 1849, Isaac C. Haight, who was with a party of explorers in southern Utah, wrote that Walker's band killed a Paiute slave boy when measles broke out among their numbers. The sacrifice was

27 Jones, *Forty Years*, pp. 51-53.
28 *Idem*, p. 53.

intended to satisfy an "angry God," whom they supposed was afflicting the Indians.[29]

Sometime after the difficulties with Walker's band, his people went on the warpath for the last time. For many months he and his followers in northern Utah caused considerable damage to property, and several white people were killed. The "Walker War" had no sudden termination, but hostilities lingered on for two or three years, gradually diminishing in fury until peace reigned. Walker died on January 29, 1855; history records that he was buried in a cliff of rocks which was walled in. Seven head of horses and two Piede prisoners were killed, and with one live Piede boy, these were all sealed in the tomb with the body.

The burial of animals and prisoners, either dead or alive, with the corpse of a notable interjects a new concept in Ute burial practices. In aboriginal Ute and Shoshone culture the burial of household articles and personal belongings was a very common practice, but the custom of including forms of animal life, and particularly human life, in these categories seems to be a rather modern elaboration. That the custom might have undergone a gradual development, climaxed by the death of Walker, is indicated in several references. For example, Bancroft recorded that "when measles appeared among the natives camped two miles north of the settlement of Salt Lake City, a great number of them died." In a footnote, on the same page, he added, "They killed their dogs when their masters died."[30] A major step was alluded to in a previous reference, when a Paiute boy was sacrificed to pacify an angry spirit which caused measles among Walker's band while they were in southern Utah.

The Saints themselves prolonged the traffic by their purchases of children. Their policy was designed to gradually curtail slavery as they did not have the military strength to eliminate the practice at once. Consequently, in 1851, Brigham Young urged the citizens of Parowan "to buy up the Lamanite children as rapidly as pos-

29 From a manuscript.

30 Bancroft, *History of Utah*, p. 278. A number of references substantiate Bancroft. Archaeological data discloses the practice of burying animals with the dead was post-caucasion. It also indicates that burial of humans with notables was a very rare occurrence, even in Walker's time.

sible."[31] To the Territorial Legislature, in 1852, he said, "Many a life by this means is saved; many a child redeemed from the thraldom of savage barbarity, and placed upon equal footing with the more favored portions of the human race."[32] Subsequently, the Legislature enacted laws which regulated the purchase of Indians, and provided for the eventual discontinuance of the practice. Persons who purchased children were obliged to provide them with clothing and food, and to furnish them with an education.

SUMMARY

Slavery among the intermountain Ute, Paiute, and Shoshone was stimulated by a market opened by the Spaniards. There were many intermediaries between the ultimate household and the band from which the captives were seized. These included native Ute and Navaho, as well as Spanish-Mexicans. The entrance of the Mormons into Salt Lake valley endangered the flourishing slave traffic as their villages were erected astride the main thoroughfare of the Spaniards between Santa Fé, New Mexico, and southern California. This was the "Old Spanish Trail."

Slave sources were divided generally into two categories: those acquired in more peaceful pursuits, such as barter or exchange, or in gambling bouts, and those acquired by force, such as capture or in warfare. Girls were especially desirable as they could be more readily conditioned to the domestic life of their masters. Boys were apt to be more rebellious, and they would often run away. Values had already been established by the Spaniards when the Mormon pioneers arrived in Salt Lake valley. To them, the costs generally consisted of a rifle, a horse or cow, trinkets, or food items, such as flour or bacon. Hunger seems to have been a very stimulating drive in the sale of children to whites or to the more prosperous Indians, such as Ute and Navaho. Children who were captives of the Indians were treated in a most cruel manner and were starved and beaten. They were killed if they became a burden to their captors through sickness or inability to travel. The physical condi-

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31 Bancroft, *op. cit.*, p. 317, from a manuscript, *History of Brigham Young*, 1851: the manuscript is also quoted by Brooks, *Indian Relations*, p. 6.

32 Carter, *Indian Slavery*, p. 151.

tion and appearance of the captive evidently played but a minor part in the bargaining between Indians and Spaniards.

Both Mormons and Spaniards felt that they were improving the lot of the Indians by imposing their brand of religious ideology and moral values upon the captives. The Mormons, however, had the advantage of occupying the same territory as the bands which supplied the captives. Their military power was likewise greater than the Spaniards'. What is most important, however, is that the Mormons did not intend to perpetuate slavery. With this policy in mind, together with a superiority of military power, slavery in the Intermountain West was doomed.

The most striking result of Spanish slavery was the development of bands of raiders which preyed upon the weaker bands in their vicinity. Foremost among these were Walker's raiders. This group was well armed and mounted long before the Mormons entered into the scene, while in the person of Walker himself there were exhibited unusual qualities of leadership. He was able to command a permanent group of men which roamed from Utah Lake to southern California. In his band there was introduced human sacrifice and the burial of humans with the bodies of notables. While the practice was extremely brief in the history of the Utes, it does give some indication of the extent of changes wrought upon Ute society after the Spaniards entered the area.

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FORT DOUGLAS, UTAH

AN ANALYSIS OF THE CENTRAL ASIAN SILKS EXCAVATED BY SIR AUREL STEIN

LILA M. O'NEALE AND DOROTHY F. DURRELL

WOVEN and embroidered fabrics from Chinese Turkestan and the deserts of Outer Mongolia are highly significant for the interpretation of early Chinese weaving and for an understanding of Asian interrelations in the period from the beginning of our era to the twelfth century. Because the interesting silk finds made by Sir Aurel Stein in Central Asia may remain unknown to many by reason of the relative inaccessibility of his published works, it seems desirable to present here our analysis of their technical characteristics in parallel to an earlier study of the wool fabrics in his collections.

INTRODUCTION
CLOTH FINDS
CLOTHING AND ACCESSORIES
VOTIVE FABRICS
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YARNS, BRAIDS, ODDMENTS
STRUCTURAL TECHNIQUES
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INTRODUCTION

Whatever we attempt to learn concerning the Stein collections will be despite the difficulties inherent in an apportionment of objects between the Central Asian Antiquities Museum, New Delhi, and the British Museum. Most students will perforce content themselves with the detailed "Descriptive Lists" compiled by experts whom Stein called to his assistance. The "Lists" form integral parts of the day-by-day record made for each excavated site.

Sir Aurel's publications comprise scientific accounts and personal narratives. Thus, *Sand-buried Ruins of Khotan,* a semi-popular report of his first expedition (1900-01), was followed by the two-volume *Ancient Khotan.* His second trip (1906-08), on which the principal objective was the Tarim Basin, furnished the material for

Ruins of Desert Cathay and the five-volume *Serindia*. His third expedition (1913-15) explored Taklamakan Desert; the great four-volume report *Innermost Asia* made known the results. Beside these, there are Stein's papers and addresses before scientific societies, and a volume of plates, *The Thousand Buddhas*, devoted entirely to the painted banners of Ch'ien-fo-tung near the present town of Tun-huang. Mr Fred H. Andrews is responsible for all descriptions of the textile finds. His analyses, in most instances, are clear and uninvolved.

Previously, I had gleaned from these various published accounts information concerning the early wools of Chinese Turkestan.[1] Miss Durrell became interested in a similar undertaking, concentrating her attention on the silks. Certain sections of this paper are taken from her thesis presented in partial fulfillment for the degree of Master of Arts, Department of Decorative Art, University of California at Berkeley.

Interpolations at various points in the text come from sources other than the Stein reports. An organized program for the study of the archaeological textiles discovered by the Mongolo-Tibetan expedition of P. K. Kozlóv in 1924-25 was instituted by a number of scientists connected with the State Academy for the History of Material Culture (Leningrad). Including as it did workers in various laboratories in Moscow as well, the study "became a great enterprise." Results of this investigation translated into English were made available to the membership of The Needle and Bobbin Club in New York City.[2]

The Kozlóv silks, particularly the silks from the burial mounds of Noin-Ula, 500 km south of Lake Baikal, bear striking resemblances to those excavated by Sir Aurel Stein in Turkestan. Certain pieces from Noin-Ula in the Pennsylvania Museum of Art, Philadelphia, and in the Textile Museum of the District of Columbia, Washington, are described and analyzed in a series of "Notes" at the end of the translation. For this valuable information we are indebted to Eleanor B. Sachs and Nancy Andrews Reath, authors of *Persian Textiles*.[3] Excellent photographic reproductions of woven and

1 O'Neale, *Survey of the Woolen Textiles*.
2 Voskresensky and Tikhonev, *Technical Study of Textiles*.
3 New Haven, 1937.

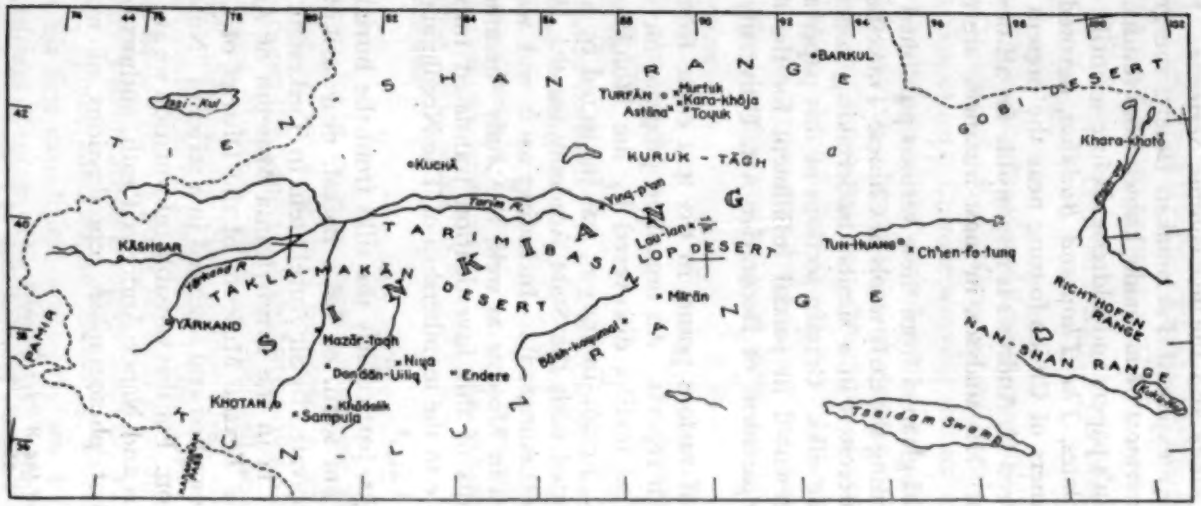


FIG. 1. Location of the principal sites in Central Asia.
The Noin-Ula site is a considerable distance northeast of Stein's Sinkiang localities. It lies north of Urga on the Tola River in the deep bend to the northwest of the Kharagal River (approximately 107° E, 48° N).

embroidered silks from Noin-Ula are to be found in Yetts and Kümmel.[4]

Because Stein's numbering system was devised to identify the thousands of objects and fabrics in his collections, I have found it cumbersome for a paper of this length. Therefore, I have substituted for each of his specimen numbers the site name and a serial number in parenthesis. This combination corresponds to a similar one in the tabulations at the end of this paper.

The illustrated details of weaves (Plates 3-6) and stitches (Plate 7) photographed represent my interpretations of Andrews' technical terms. He uses standard terms such as plain, twill, outline, feather, etc. Most analysts would agree on the characteristic features of these. When Andrews met with a variation, he usually stopped at mentioning the fact, as will be noted in some quotations; he coined few descriptive phrases. Unfortunately limitations of space or his lack of interest resulted in the omission of line drawings to clarify technical points— (Lila M. O'Neal).

During his third and most extensive trip into Chinese Turkestan, Stein explored two burial grounds particularly rich in textile finds, Lou-lan and Astāna. Lou-lan, which includes a number of sites, is located in the desert of Lop-Nor. Sites L.A. and L.C. (200-180 BC) are among the earliest visited and they revealed the oldest discovered products of the Chinese silk industry. Astāna fabrics (550-860 AD) reveal the influence of the West as well as of China. Both of these stations were on the ancient silk routes connecting the Near and the Far East.

Silks in a great variety of weaves, many beautifully decorated, were found in abundance at other sites visited by Stein. At Ch'ien-fo-tung and the Tun-huang Limes fabrics of silk predominate. Early in the history of this area silks showing mastery of highly developed techniques were used.

The introduction of silk into Chinese Turkestan is accounted for by a legend. According to it, silk was at one time unknown in Khotan. The King, hearing that China had mulberry trees and silkworms, sent an envoy to procure seeds and eggs. Export of both was forbidden and the envoy returned empty-handed. The King then asked to marry a Chinese princess, and when he received a favorable answer, he sent an escort to accompany her to Khotan. The princess

4 Yetts, *Discoveries of the Kozlóv Expedition;* Kümmel, *Chinesische Kunst.*

had been given to understand that if she wished to continue to wear silks she must bring eggs and seeds with her. This she did, concealing them in her headdress, and upon her arrival in her new home is said to have left them at a convent with an order not to unreel the cocoons until the moths had escaped.

Stein discovered a painted panel at Dandān-Uiliq (1) which he believes has some connection with this legend. The painting, approximately 18 by 5 inches, shows four seated women. Between the first and second figures is a basket containing cocoons. The fourth holds in her hand "an instrument resembling a weaving comb or brush." At her left are "outlines in red, possibly meant to represent the framework drum used in spinning silk thread."[5] The so-called drum also bears certain resemblances to primitive warping boards.

CLOTH FINDS

Much of the silk cloth recovered on Sir Aurel's trips had been partly destroyed by the elements. The excellent preservation of the Lou-lan fabrics is amazing, since many of the exposed bones had suffered greatly, and no skeleton was found intact. One thread system of some fabrics had disintegrated leaving only the parallel threads of the other. An illustrated fragment from Site C (1) was opened out with great difficulty in order to reveal the design. All the wefts had disappeared and the warps were mere twisted strings. Occasionally bits of silk had adhered to objects of less perishable nature such as the bases of statues to which strips of votive silks were found sticking.

A significant relic of the silk trade found at Lou-lan, Site L.A. (1) is a roll of unused yellow silk, so brittle that it broke in two when lifted. The find supplied evidence which aided in determining the standard loom width of silk fabrics during a period when trade with the West flourished. In its original state the roll was 18.75 inches wide and 2.5 inches in diameter. Two strips of undyed silk found later in one of the Han Limes watch stations furnished decisive evidence as to widths. One was 19.69 inches wide and the other, although damaged and possibly shrunken at the present time, bore a Chinese inscription giving its origin, dimensions, weight, and price. The date can be established as about the end of the first or

5 Stein, *Ancient Khotan*, vol. 1, p. 300.

the beginning of the second century AD. The width recorded in the inscription, 19.83 inches, was standard during the later Han period. Although the painted silks from Ch'ien-fo-tung and pieces from other sites indicate that silk widths were increased sometime before the tenth century, those like the Lou-lan roll made for export, remained unaltered.

CLOTHING AND ACCESSORIES

Excavations in the burial grounds of Lou-lan and Astāna revealed few complete articles of clothing, but many well-preserved fragments of clothing since it was the custom to use remnants for wrapping the dead. This custom was also noted at Ying-p'an, a site approximately as old as Lou-lan. Stein suggests that the practice may have been motivated by a strong feeling against waste in connection with burials. Some of the silks were well worn before being used as wrappings, as attested by a find at Lou-lan, Site C (2). One garment had been constructed of several cloths of different designs. Scraps of this character rarely give a clue as to the original type of garment, but despite their limitations, they comprise the main source of our knowledge of textiles from these sites. Several pieces from Lou-lan, Site C (3, 4) appear to have been parts of what Andrews calls "body bands." They consist of three layers of material: the silk, and lining with felt attached. Silks of very fine texture show that persons of importance frequented the Limes. The mention of silk garments in a garrison kit list furnishes evidence of the use of silk by the military. Although dirty and sand-encrusted, many of these fragments are in excellent condition.

At Astāna the dead were wrapped either in fragments of worn garments or in plain cotton or silk garments which may have been especially prepared for burial clothing. Scraps at this site show great skill in construction processes. Some garments were padded with silk wool (waste) and lined. One Astāna specimen (1) has carefully shaped and pinked seams.

Most of the Astāna bodies had a face cover which invariably consisted of an oval or nearly circular piece of polychrome figured silk edged with a frill of plain silk. It is significant that although some of the other silk fragments are of Chinese origin, these face covers are not Chinese. The practice of using them must have been current before commerce with China was simplified by her annexation

of Turfan in 640 AD because face covers were found in nearly all groups of tombs dating from 608 AD. The body was usually covered with a shroud of plain cotton, or of undyed or indigo silk. Miniature garments of paper and silk designed to symbolize the clothing for the next life were also buried with the Astāna dead. Among the articles found are cuffs, a hat, and an imitation dagger sheath. Quite unlike these miniature garments in purpose are those which dress a small wooden doll from the Niya site (1). Its total length is only 3.5 inches, but it has legs hinged to the flat piece of wood forming the body. It is dressed in light brown silk drawn in at the waist with a red sash.

Garment accessories are represented by fragments of silk headbands and small silk-covered canvas knobs, possibly buttons, from Ying-p'an (1). A fragment from Astāna (2) is a gauze sleeve-like object. Attached to it is what may be a shoulder piece in plain silk. A girdle of soft, thick, cream-colored silk, made five feet, five inches long by the full width of the material (approx. 22.5 inches) was found in a refuse heap at Mīrān (1). The central section of the length was in good condition, but the ends were worn through by constant knotting.

Several small bags are included among the Stein silks. One for spice or medicine from Tun-huang (1) is of gray silk; the lining was once a Chinese letter written on silk. From Lou-lan, Site A comes a small crimson bag (2) and one in undyed silk (3). The latter was designed to hold a gift, for it has inscribed upon it the names of the sender and the recipient. A square of figured silk (1) having the appearance of a wallet when drawn together was found at Khara-khoto. Some special purpose may be represented by the object from Lou-lan, Site A (4) described as "sheath-like . . . tapering, triangular, of very fine white silk, finely sewn."

Among the few complete garments the shoes are particularly noteworthy as exemplifying several techniques. An Astāna tapestry shoe (3) is woven to shape; a Toyuk shoe (1) is quilted. Perhaps the most elaborate, to judge from the various descriptions, is a pair of lady's shoes from Kara-khōja (1). Andrews' analysis follows:

Koa.III.03. Pair of embroidered shoes. Stout leather soles. Side, verdigris colour tapestry, sewn to stiffening by minute stitches which give the effect of fine quilting. On front two parallel bands of plum colour tapestry, ½ inch wide

with space of 5/16 inch between, are applied from edge to sole. Between, a different kind of tapestry with pattern in buff lines.

A single line of round fine green braid runs down centre. Each edge of plum bands is worked with yellow braiding, and on each band, in fine cable braid, are linked fleurs-de-lis. Back of heel treated the same, but a single line in place of fleurs-de-lis.

On each side of central bands in front is an elaborate flower worked in Chinese feather stitch in blues, green, pinks, and yellows, and outlined with a couched thread; similar work at heel. Edge bound with buff silk of extremely close and fine texture, beautifully shaped to the horn at instep by gathering, and with three rows of stitchnig. Lining crimson silk.

A most exquisite example of workmanship. The woven materials are extraordinarily close and strong, and are probably made expressly for ladies' shoes. 8½ inches by 2¾ inches.[6]

VOTIVE FABRICS

Fabrics for votive purposes form a great part of the Stein silk collection. Numerous small pieces came from the Tun-huang hoard. At even the smallest of the ancient temple sites, cloth scraps could be found clinging to the walls or the base of an image. The custom of offering ex-votos is still in existence in some parts of India. At Astāna bits of cloth fastened to twigs made miniature banners. Similar little flags were found at Endere, Khara-khoto, and the Limes. At Ch'ien-fo-tung (1) were found seventeen small canopies in the form of silk or linen squares with silk tassels at the corners. The silk pieces, ranging from about five inches to ten inches square, were strained over twig frames.

At Mīrān artificial flowers had been fastened to a piece of heavy cotton material covered with plaster, then painted blue. Evidently the color was meant to suggest a sacred lake with floating water lilies. The petals are of pale red, buff, or blue silks or cotton made up with wooden pegs and tufts of threads to represent stalks and stamens. Artificial leaves of silk cloth, probably also votive in nature, were found in the tombs at Astāna, and gauze flowers were found among the Ch'ien-fo-tung silks.

The largest number of silks classed as votive are the banners and their accessories from Ch'ien-fo-tung.[7] Although some of these, crushed and covered with dirt and soot, required great pains to restore, many others, found neatly rolled, had remained soft and

6 Stein, *Innermost Asia*, vol. 2, p. 601; vol. 3, plate 87.

7 Stein, *Serindia*, vol. 4, plates 56-123.

pliable. In general, the damage to these delicate materials was incurred while they still hung in the shrines, before being stored.

Votive banners give us not only pictorial representations of Buddhist divinities and mythological scenes, but they furnish us with valuable illustrations of various constructive processes and methods of surface decoration. Divided on the basis of fiber content, sixty-two percent of the banners are silk, the remainder of paper or linen.

Stein has grouped the banners into three main classes: (1) the large ones designed as hangings for the walls of shrines; (2) the transparent banners designed to hang free, and (3) a group, all of paper, and differing from the other two.

The wall banners of plain fine silk or linen vary greatly in size; many are large. One Ch'ien-fo-tung example (2) measures 7 feet 2.5 inches by 3 feet 7 inches. A few banners are mounted on cloth or paper; the unmounted banners are bordered with silk or other fabrics. In this group, almost eighty percent of the number listed (168) are silk.

The transparent banners form the numerically largest group. These were usually made of gauze or a very fine plain-weave silk in order not to further obstruct the light in the dim caves. Thin sticks of wood at the top and bottom edges kept them spread; a board glued to the bottom served as a weight. At the top is a triangular piece of silk by which to hang the banner, and at the bottom a long strip of the same material as the painted section and of the same width. This strip is split to form three or four streamers. From the ends of the upper stick hang two long streamers of plain color. Usually these accessories to the banner proper are decorated fabrics. The transparent banner, because it hung by the point of the triangular headpiece and twisted in the breeze, has the same designs painted on both sides. Almost eighty percent of the total number listed (230) are silk.

Distinct from the painted banners for entrances are the temple banners with their accessories. They are similar in shape and construction, but of plain-weave silk, damask, or printed silk and have no pictorial representations. Textiles used to decorate the bases of sculptured figures or altars of shrines are similar to the two large valances from Ch'ien-fo-tung (3, 4). They consist of long bands of silk (one is twenty-six feet long, the other nine feet) with triangular

tabs attached to the lower end. Under the tabs hang streamers over a short, plain, silk backdrop. The streamers are frequently made of several pieces of silk assembled in no particular arrangement. Among the fabrics constituting the streamers of Ch'ien-fo-tung banners (4) are plain silks, damasks, figured silks (Andrews' polychrome damask), gauzes, printed silks.[8] Finishing the ends may be decorative knots or tassels.

INSCRIBED SILKS

Silks with inscriptions can be divided into two groups: those which serve as documents, and silks on which there are only a few characters. In many instances these relics have proved of special value in determining the date of ruins at which they were uncovered.

A strip of fine undyed silk from Lou-lan, Site A (5) on which were inscribed two lines of Kharoṣṭhī was the first evidence Stein found to confirm the tradition that the Chinese used silk for writing material before the invention of paper. Later discoveries among the Limes watch-towers furnished additional proofs. One of these Tun-huang documents (2), inscribed with nine lines of Kharoṣṭhī, is too badly torn to be deciphered, but would seem to be a letter or an order; two well-preserved letters (1), which had been sewn together to form the inner lining of a small gray silk bag, are in Chinese. In the same refuse heap was uncovered a silk envelope on which is written the names of the recipient and the sender. The envelope was probably meant to cover a letter also on silk since the refuse pile is older by half a century than the date for the invention of paper. Silks inscribed with Brāhmī and Kharoṣṭhī as well as Chinese were picked up at the watchtowers. A Pōthī leaf of silk inscribed on both sides with Brāhmī script from Bāsh-koyumal was the first writing in the Indian language to be discovered on silk. A number of Kharakhoto silks display Chinese characters; most of the Tun-huang banners are inscribed with prayers. A piece of fine, plain-weave silk from Mīrān (2) has inscribed along a red stripe prayers for the pious donors of the votive banner.

In addition to envelopes as indicated by the Tun-huang Limes find, documents were protected by other methods. A Niya document had been wrapped in yellow silk and tied with coarse string; a Sog-

8 *Idem*, vol. 2, p. 985.

dian document from a Limes site (3) was packaged in brown silk. Some documents found at Tun-huang were folded, and others (4) were merely tied with string.

One of the several manuscript-roll covers found at Ch'ien-fo-tung (5) is made of split bamboo slips held together by narrow striped bands of weaving done with thick silk yarn. On them is tent-stitch embroidery (Plate 7, C) in seven different colors, each on a striped ground of the same color. Another roll cover from the same site (6) is of plain silk bordered by two inches of thick polychrome figured silk and striped with fine silk tapestry. Silk fabric used in binding is exemplified by a strip of figured silk from the back of a Buddhist devotional handbook found at Ch'ien-fo-tung (7).

The "Descriptive Lists" record but do not explain some combinations of materials. For example, a Ch'ien-fo-tung specimen (8) is entered as "ragged fragments of silk damask . . . pasted on paper." At Kara-khōja painted paper fragments were found pasted on crimson silk, probably to strengthen the paper. Objects of unknown use are small "slightly waisted" wooden cylinders, pierced lengthwise and wrapped in silk, discovered in the hand of the dead person in several Astāna graves (4). At Lou-lan, Site C (5) Stein found a silk-covered felt pad of kidney shape resembling a badge.

YARNS, BRAIDS, ODDMENTS

Silks occur in various other forms in the Stein collection. Silk waste is mentioned as having been used for padding many of the garment fragments wrapped about the dead at Lou-lan sites; it is found among the refuse at the Limes watchtowers, and it is referred to as "silk wool" in the descriptions of padded garments from Astāna (5, 6). Listed among the finds from Tun-huang Limes (5) is a handful of raw silk. A "tangle of dark blue silk thread" (1) is reported from Endere Fort. Embroidery and sewing thread as well as silk cords and string were frequently found. At Khara-khoto (2) and Niya silk threads were found twisted together. Those from the first site are described as "a tangle of buff silk thread, two-ply, twisted. Thickness, one-sixteenth inch." An Astāna tassel (7) consists of yellow and crimson fringes around a three-tiered wooden core. Several more of the same type were discovered at Ch'ien-fo-tung. Tassels and fringes properly come within the category of threads.

The Russian scientists made several statements[9] as to the nature of the raw silk and the silk threads found in the ancient Mongolian textiles. In contradistinction to the round cross-section of silk from the cultivated silkworm, the Kozlóv silks were oval rhomboidal in cross-section. This form is characteristic of filaments from the semi-cultivated worms. Modern Chinese silk known as pongee is made of yarns from this source.

In modern practice, several silk filaments are reeled off from the cocoons and subsequently twisted to give the strand the necessary strength for the weaving processes. The Kozlóv textiles are woven of silks also obtained by winding "many" filaments drawn simultaneously from the cocoons, but without twisting at any time. Throughout a section on the chemico-technical analysis of fabrics[10] a point is made of the fact that very few separate fibers can be seen at the end of the thread, owing to the "exceptional evenness and cohesion of the thread produced by the closeness of the fibres to each other."

There are a few silks in which another fiber has entered. These union fabrics have special purposes and do not come within the usual classifications of banners, garment materials, and the like. An Astāna shoe of silk tapestry (3) originally had a warp of vegetable fiber; a Lou-lan, Site C fabric (6) has silk warp and wool weft. There are two examples of bamboo used with silk. A matting from Karakhōja is woven of bamboo and silk laid alternately for warp. Silk weft interweaving with them is so closely battened as to cover the warps. Apparently the bamboo is for stiffness. Two manuscript roll covers from Ch'ien-fo-tung (5, 9) were constructed of bamboo slips held in place by bands of woven silk.

Braiding, plaited work, implies handwork done without the aid of the loom. A few examples of silk braid are found among the Ch'ien-fo-tung fabrics. One of these (10), about a half-inch wide, is plaited with thick soft yarn in zigzag lines of white, light green, and yellow. It is similar to other braids used as ties of manuscript-roll covers. A second (11), from the same site, is also in three colors—white, scarlet, and dark blue. In this braid the zigzags cross the narrow width. One cannot judge from the illustration how many plaiting strands were involved, but the reconstruction (Plate 5, E)

9 Voskresensky and Tikhonov, *Technical Study of Textiles*, p. 7.
10 *Idem*, pp. 27-37.

shows an identical effect with sixteen strands. A girdle from Lou-lan, Site C (3) is partly made of strips of braid with a diagonal pattern of blue lines.

In describing a shoe from Kara-khōja (2) Andrews speaks of a "line of white silk cable cord throwing out a trefoil scroll at intervals of seven-eighths inch." By "cord" he might mean any hard-twisted multiple-ply strand.

A "mass of cuttings" from Astāna (8) includes various silks in the form of small rolls tied with threads. Silk tapes [woven ribbons?] for trimming garments and for ties on manuscript covers at Ch'ien-fo-tung are listed. A silk band from Lou-lan, Site C (3) is made of "braid"; and a cloth shoe from Toyuk (1) is trimmed with braid. Andrews describes it as "covered with silk and ornamented with floral embroidery and small rosette made of fine cable braid."[11] It is impossible to know without being able to handle the fabrics the meaning of a few of the terms Andrews uses. He may mean one of the several heavy cords or round braids, the simplest of which requires four strands (Plate 5, D).

It is interesting that within documents from this region appear several references to silk. Chinese document No. 903 from Lou-lan, Site A, is a record of tribute paid in pieces of silk by a barbarian. Document No. 490 from Tun-huang Limes mentions the receipt of "32 feet of silk fabric" by a company stationed there. The writing on a wooden label, No. 705, mentions silk string for a certain type of crossbow used by a company under the Han dynasty. Hemp and silk bow-strings are referred to in several documents from the Limes. Document No. 019 is an inventory of clothing and various other textiles. Document No. 72, the kit list of a garrison soldier, includes among other entries "an undress costume of white silk."[12]

STRUCTURAL TECHNIQUES

1. Plain Weaves and Twills

The simplest textile construction is accomplished by interlacing a single weft yarn over and under single warp yarns held taut at right angles to it. The result is known as plain-weave cloth (Plate 3, A). This type of fabric, with examples from all sites, is plentiful in the

11 Stein, *Innermost Asia*, vol. 2, p. 620.
12 Stein, *Serindia*, vol. 2, fn. 64.

Stein collection. Plain silks had many uses: they frequently served as linings for bags and shoes, and as the principal material for shrouds, banners, and their accessories.

The plain silks noticeably vary in texture and uniformity of weave. Some of them are coarse and loosely woven. A number of references are made to "canvas," and a few to "silk canvas." Linen and cotton fabrics are described as "resembling artist's unprimed canvas of modern time."[13] A Lou-lan, Site C canvas strip (7) is the foundation for embroidery. In several instances, the fiber content of fabrics designated as canvas is not recorded.

Many of the plain-weave cloths are so fine and close-textured that the construction is almost invisible. Plain, finely woven silks were used at Ch'ien-fo-tung for painted hangings. The banners designed to allow the light to pass through them were of an equally fine silk sometimes referred to as "fine silk gauze" and at others as "gauze-like silk."[14] Technically, there is a constructional difference (Plates 3, A and 6, A), but in this connection, Andrews is stressing the transparent quality of the material which appears "always" to have been used for these banners. In a description of an Astāna plain-weave fragment (9) he indicates the technical difference between the two by placing quotation marks around the word gauze. He speaks of the cloth as "fine open silk muslin, resembling fan 'gauze' or bolting." The latter, used for sifting fine cereals and flours, is a plain-weave silk.

Among those plain silks that differ from the ordinary is a Khara-khoto fragment (3). It was unevenly woven, perhaps not intentionally, and appears banded by alternately fine and coarser textures. Unevenly spun yarns are the reason for the rougher, rather coarsely woven fragments of plain silk under a Ch'ien-fo-tung number (12). One of three layers of a Khara-khoto fabric (4) through which embroidery was done was woven "with a thick 'tram' warp with widely spaced thin weft." Andrews uses tram to characterize any "slightly twisted silk yarn."[15] The word ordinarily is applied to the filling yarns.

If the warp threads of a plain cloth are thicker than those of the

13 *Idem*, p. 846.
14 *Idem*, p. 844.
15 *Idem*, p. 898.

weft, the surface is ribbed lengthwise of the material and the fabric is often called a "cord." If the weft threads are the thicker, the rib is crosswise of the material and the fabric is known as a "rep" (Plate 3, B and C). Scraps of ribbed silks occur at most of the sites. Several fine ones were found among the remains of the watch-towers of the Tun-huang Limes. A Ch'ien-fo-tung ribbed silk (13) deserves special mention in that the warp system has two fine threads alternating with two heavy threads (Plate 3, D). Andrews makes a point of the fact that some of the ribbed silks may not have been intended as such but became ribbed through shrinkage of either yarn system. During the process, the cloth acquired a changed texture.[16]

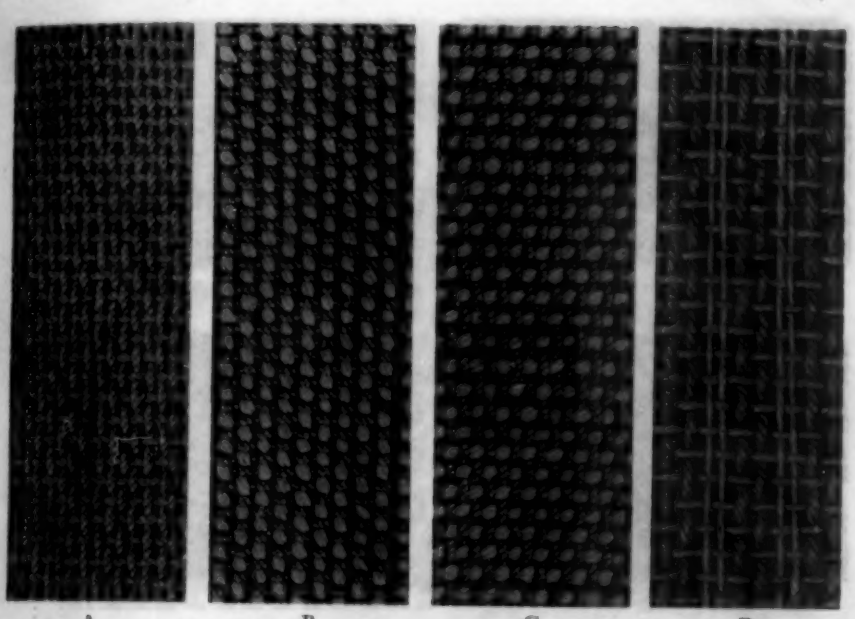
One method of varying a plain weave is by using different colors of warps or wefts to produce a stripe, or by introducing colors in both systems to produce checks and plaids. There are very few striped materials among the plain weaves, or among cloths of more complex weaves, for that matter. A Ch'ien-fo-tung silk (14) in natural color has three pinstripes in light blue; a Tun-huang fragment (6) is dark blue with pin stripes of buff. A Mīrān piece (2) is more elaborate. The ground color is buff, the lengthwise stripes consisting of closely-spaced lines, alternately dark red and green. These bands, nearly 2.5 inches in width, are spaced almost that same distance apart on the buff ground. Down the buff runs a red line and the letters of an inscription.

One plain-weave silk suggests that the weaver spaced his yarns to achieve a decorative effect. Andrews describes an Astāna veiling (10) as loosely woven. The pattern is "an open square diaper formed of groups of six ends [warps] and six picks [wefts] interweaving." There are ten of these small blocks to the inch, and probably spaces framing each block.

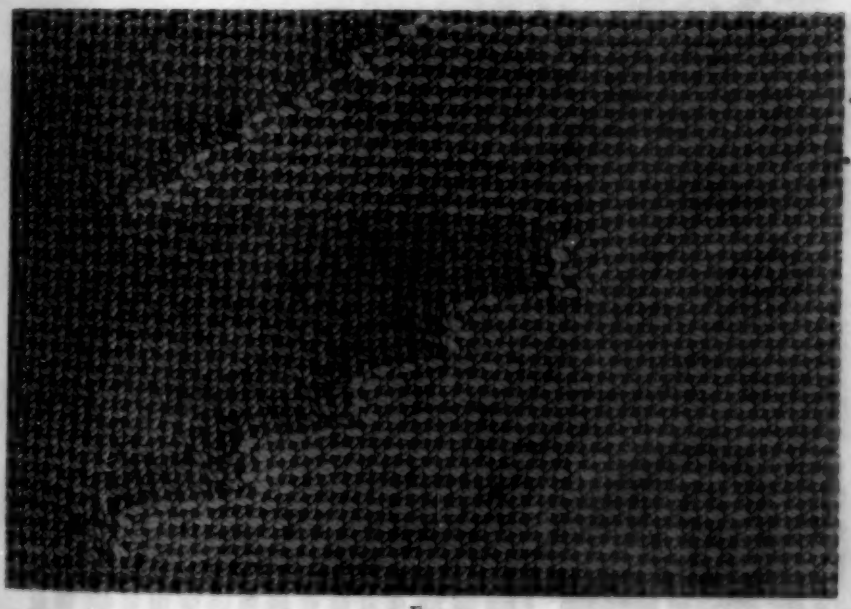
There are a few silk tapestry pieces in the Stein collection. Tapestry is usually plain weave in structure (Plate 3, E) with distinguishing features of texture and patterning. It is often pictorial. Bobbins carry various colors of weft yarn but each bobbin weaves only to the edge of its individual color area.

A few tapestry fragments were recovered at Ch'ien-fo-tung. These are of exceedingly fine technique, probably requiring needles to carry the yarns. The colors are rich, the designs complex. The techniques

16 *Loc. cit.*



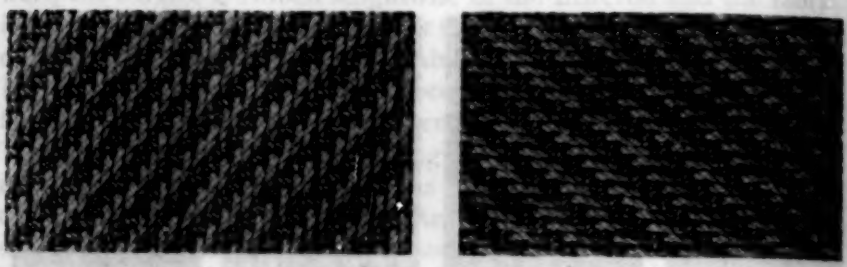
A B C D



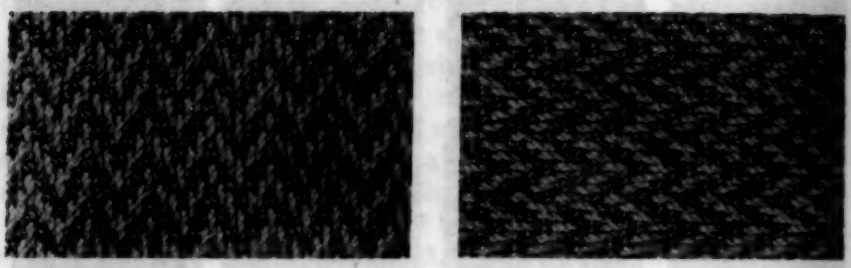
E

STRUCTURAL WEAVING TECHNIQUES

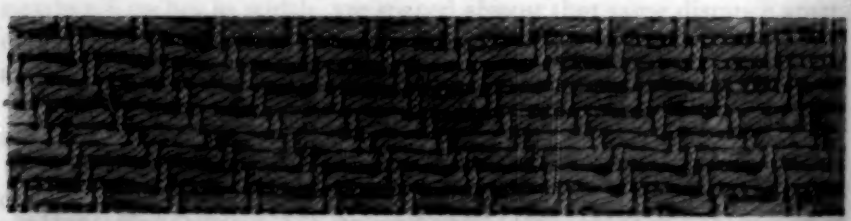
A, plain cloth weave; B, warp rib or cord; C, weft rib or rep; D, Chinese variation of vertical ribbing; E, Oriental type tapestry with Kelim slits.



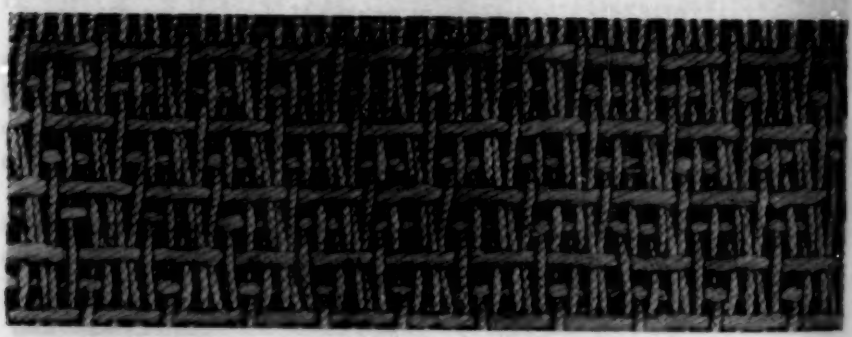
A B



C D



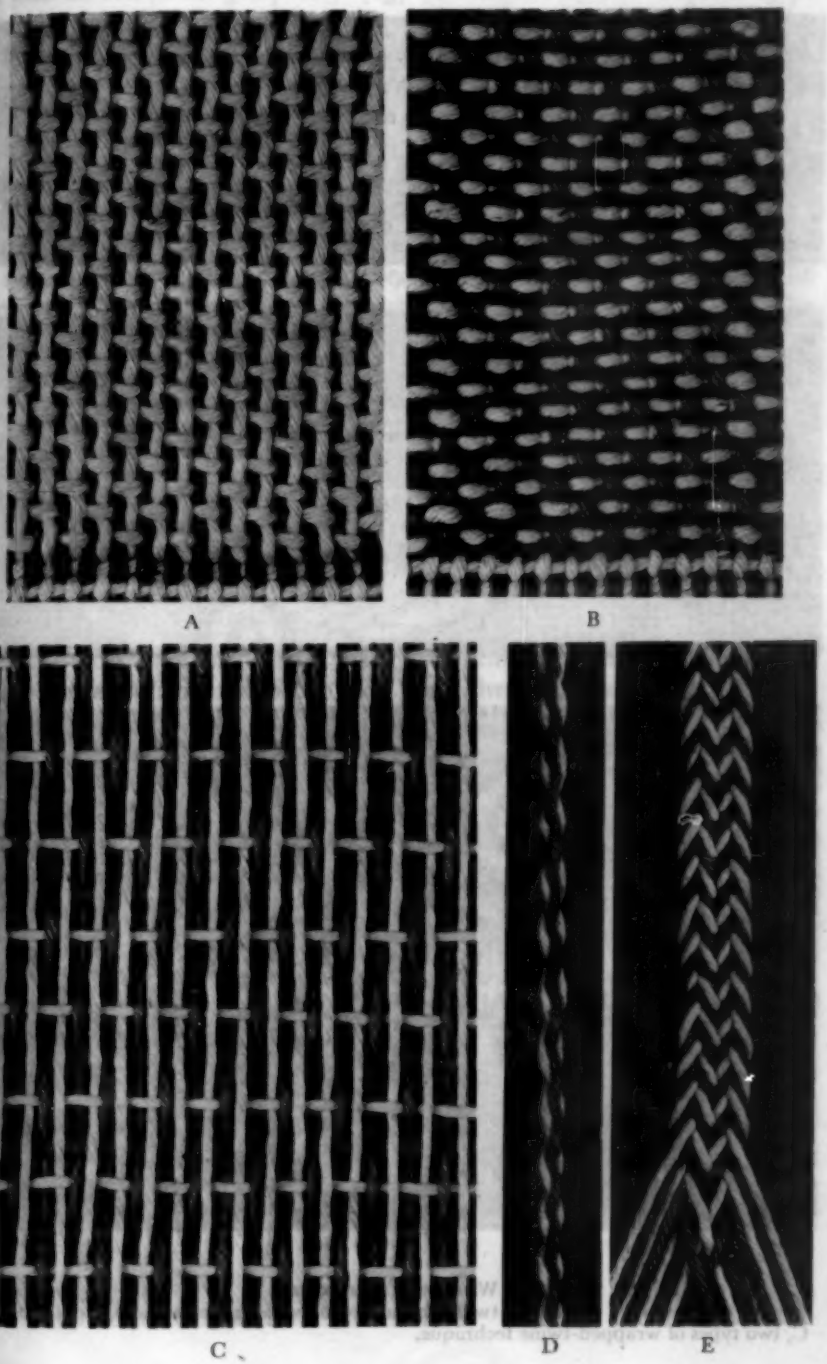
E



F

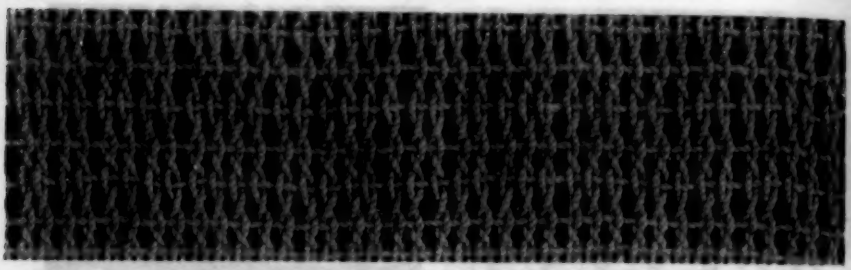
STRUCTURAL WEAVING TECHNIQUES

A, four-thread twill with warp face; B, four-thread twill with weft face; C, horizontal herringbone; D, vertical herringbone; E, Chinese variation of twill with surface weft and backing weft; F, same twill left open to show method of interlacing.

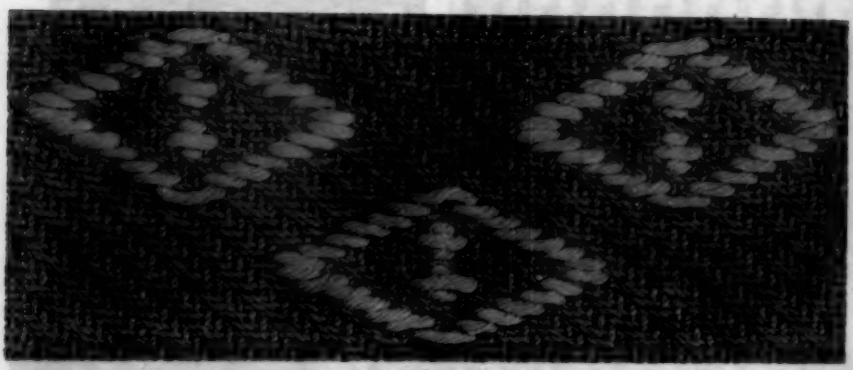


STRUCTURAL TECHNIQUES

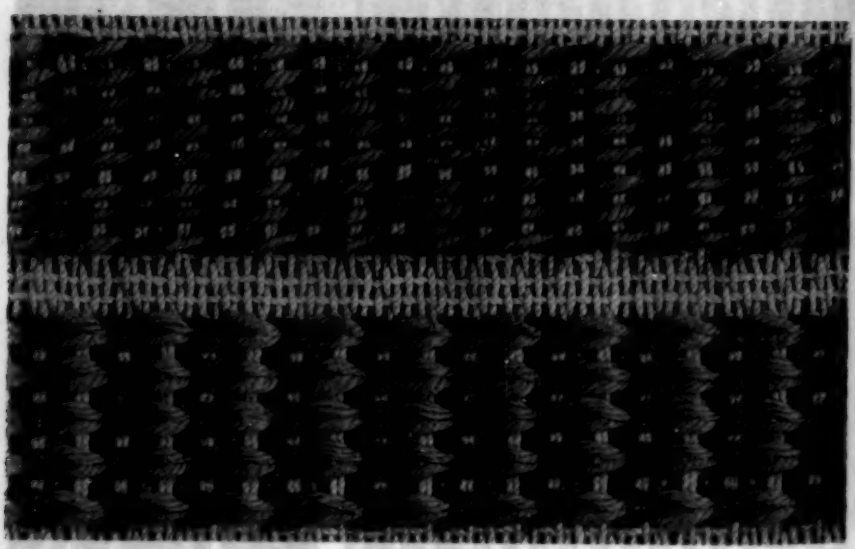
A and B, surface and reverse sides of fabric woven Chinese warp rib; C, warp rib left open to show method of interlacing; D, four-strand round braid, possibly Andrews' "cable cord"; E, sixteen-strand decorative plaiting.



A



B



C

WEAVING TECHNIQUES

A, simple gauze weave; B, twill ground brocaded with free-standing spot motives; C, two types of wrapped-twine technique.

in one Ch'ien-fo-tung tapestry (15) resemble those of Coptic Egypt and Ancient Peru. In the Chinese tapestry the Kelim slits at the edge of each color area have been left open (Plate 3, E). Ordinarily, unless very short, these were sewn up by hand upon completion of the weaving. It is of interest that the gold strands introduced into this and other tapestries were made by a technique still prevailing in the Far East. The gold leaf was laid on tough paper subsequently cut into narrow strips. It shows as flat strands in the woven fabric.

The only silk tapestry from the Astāna site (3) is the cloth of a a shoe from which the vegetable warps have disintegrated. The inwoven Chinese characters furnish the evidence of its origin. The Kara-khōja shoes with their tapestry sections have been described in detail in connection with the clothing specimens.

At Lou-lan, Site C, only two pieces of tapestry weaving in silk (8) were found; their patterns were described as "indeterminate and unimportant." A number of wool tapestry fragments came from this site, and Stein has two explanations to account for the conspicuous lack of silk examples: that it may be accidental, or that it is possible that the technique came in from the west. There is evidence for Assyrian and Greek tapestries from times as early as the sixth century BC.

A twill is the result of increasing the intervals in the weaving by passing the weft over two or more warp threads, under one or more, and so on, regularly. Each succeeding weft thread must move one warp to the right or left, thus forming a diagonal wale. The long threads on the surface of the cloth are the floats. If the warp threads form these, the fabric is said to be warp face; if the weft threads float, the fabric is called weft face (Plate 4, A and B). Twills are found in many combinations of intervals: 1 and 2; 2 and 2; 1 and 3, etc. Andrews' definition of a twill is based on the four-thread unit in which the weft passes over three warps, under one, over three, and so on.[17] The herringbone twill, vertical or horizontal, is one of the simplest variations (Plate 4, C and D). In his descriptions Andrews often refers to a cloth as being a "satin" or "sateen" twill by which he probably means a twill with floats longer than the distance over three warps or wefts. As far as one can tell from a study of the plates, the

17 *Loc. cit.*

majority of the silks conform to his simple 1-3 or 3-1 twills, although no statement indicates that these were the usual formulæ.

The twill weave is a most valuable technique from the designer's standpoint. It produces a strong fabric at the same time creating an unbroken surface of warp floats or weft floats which conceal the threads of the opposite system. Designs ranging from a simple diagonal stripe to elaborate patterns can be executed.

Only a few complete cloths in the Stein collection are woven plain twills, but the weave appears in ground or pattern of many of the damasks and polychrome figured silks. Two of its most common variations, the herringbone and the broken twill, are found in the damask fragments.

All of the unfigured twills found at Astāna are striped. One of them (11) has narrow blue and yellow stripes both colors shaded; another (12) has alternate brown and green stripes. The herringbone twills are also striped. One finely woven Astāna fragment (13), forming a tubular object of unknown use, has alternate yellow and dull pink stripes. A second Astāna piece (14), a silk garment, is brown ornamented with a broad band in herringbone twill striped in several colors.

A Ch'ien-fo-tung number (16) covers two fragments "of unusual weave." The plan of the true twill is not followed. "The weft is differently treated in alternate lines. In line A it passes over five threads of warp and under one; in line B it passes under three, over one, under one and over one, the last corresponding to the warp thread passed under by weft A."[18] The weft is pressed down closely so that the longer floats of A form the surface of the fabric (Plate 4, E and F).

Although the twill weave is found among the woolens and cottons of the Lou-lan sites, it does not occur among the silks. Since the designs of the twilled wools show a Hellenistic influence, Stein suggests that the twill was employed during this early period by local weavers in the Tarim Basin before it was introduced to the Chinese silk weavers about the sixth century AD. Wool twills are also found at Endere Fort, a site coeval with Lou-lan. Among the woolens and cottons found in the Limes, and assumed to be of Chinese origin,

18 Stein, *Serindia*, vol. 2, p. 992.

there is not a single specimen of twill weave. We have as yet no definite evidence as to its place of origin.

2. Damasks and Figured Silks

Andrews makes a distinction between a monochrome damask and one in several colors; the latter he calls a "polychrome figured silk." Although technically they would seem, from his descriptions, to be the same, for descriptive purposes the two terms are useful. He says of a damask that it is a reversible patterned monochrome fabric woven in variations of twill structure. The reversible feature is proven by an illustration of a Ch'ien-fo-tung piece (3). Usually the ground of these Chinese damasks is in what he describes as a "warp sateen" twill. This we interpret to mean warp-face twill with a long float. As in modern linen damasks, the floating warp threads form the ground and the floating wefts form the pattern motives. The floats of the two systems, at right angles to each other, reflect the light differently and cause the design to stand out clearly. One minor point might be noted: the terms satin and sateen are often used interchangeably, but there is a tendency among authorities to reserve "sateen" for the weft-face satins.

A damask may be developed with large and small twills, one for ground, the other for pattern, or with either or both of these and herringbone twills or the rib weaves, or plain over-one, under-one weave. Among the Stein silks the most frequently occurring combination is the twill pattern on plain-weave ground. In addition, there are many instances of broken and irregular twills, especially in the complex design motives against plain-weave grounds.

Besides the variety of weaves among the damasks, there are also differences in size and twist of the weaving yarns. Most of the descriptions in which that feature is noted mention the contrast between the fine or medium fine threads of the warp and the broad flat, untwisted wefts. The warps of several of the Ch'ien-fo-tung damasks are described as sized. This may mean that the sericin was never completely stripped or boiled off. Some modern silks of fine texture are woven before degumming the yarns in order to take advantage of the wiry strength they possess in the natural state.

Damask patterns in these ancient silks are for the most part geometric and floral; many are simple diaper patterns. Only a few

monochrome damasks came from Lou-lan, Site C, although many of the recovered pieces are polychrome figured silks. At Ch'ien-fo-tung damasks appeared in great numbers, and Andrews' explanation for this fact is that long experience with twill weaves made the development of textile design come more easily. Astāna site produced a limited number of monochrome silks and these as well as the damasks of the Tun-huang hoard are chiefly geometric in pattern. Two of the Astāna damasks (15, 16)) by their resemblance to those from the Limes dating from T'ang times suggest Chinese manufacture. From Khara-khoto come several with small allover patterns.

A Ch'ien-fo-tung number (17) covers twenty-two fragments of silk damask. The warps are lemon yellow, the weft apricot, apparently too little different in color to lift the group over into Andrews' polychrome figured class. The pattern and ground are twills running in the same direction but differing in scale. A second example, this one from Khara-khoto (5), is in two tones of yellow, the pattern darker than the ground. The damask used in the construction of a comb case found at Lou-lan, Site C (9), has a checker pattern. Alternate squares are ribbed silk and herringbone twill. A pale cream silk from Endere (2) described as a "loosely woven silk, with slight pattern in satin stitch" appears from the illustration to be a damask.

The fabrics classified as polychrome figured silks are woven in several techniques: among them twill and a weave which Andrews terms "a variation of 'warp rib,' *not* a twill."[19] The greatest proportion are executed in twill weave. Although referred to as "satin-twill" in many of the descriptions, it is not a true satin. However, the long floats, especially those made by the broad untwisted wefts give the surface a glossy texture. All but one of the hundreds of polychrome silks in the Tun-huang hoard exemplify this weave as do many from Astāna. At Astāna some of the garments wrapped around the bodies and all of the face-covers are figured silks.

3. The Chinese Warp-Rib Weave

The unique warp-rib weave, described by Andrews as characteristic of all Chinese silks dating from Han times serves as a clue to the dating of several sites. More than half of the Lou-lan fabrics are polychrome silks. These and the silks from the Tun-huang Limes

19 *Idem*, p. 963.

are all in a variation of the warp rib. Two of the latter pieces date from the first century BC. Several other examples of the weave were found at sites of later date. A Ch'ien-fo-tung fragment (18), done in fine weaving, has a white pattern on maroon ground. Andrews comments that the pattern and weave distinguish this fabric from all others from the site. A few warp-rib silks were found at Astāna, two of them (17, 18) with yellow and buff patterns on crimson grounds. The majority of these silks are well-constructed and of brilliant yet harmonious coloring. The fine warps were either woven in the gum or if degummed had been subsequently treated with sizing. In many silks the brittle warps have disintegrated, leaving only the wefts. Two Astāna silks (19, 20) illustrate this point. They may be compared to an illustrated Ch'ien-fo-tung silk (19) from which the warps have gone. The plate shows a flat lustrous weft which manages to convey the outlines of the original pattern.

In some of the polychrome silks the diameter of the weft yarn, usually broad and strandlike, produces a "stepped" effect, for wherever these flat wefts lying side by side are crossed by finer warps in a twill weave, there occur a series of right angles at the edges of the motives. Even the most perceptibly curved lines are likewise formed in weaving by a series of almost invisible angles, but the stepped effect of the Chinese silks appears to have been part of the design plan.

Between the fourth and sixth centuries, the warp-rib construction, which Andrews believes may have developed into the twill, was abandoned in favor of the twill.

An Astāna silk (21) a fragment of a head cover patterned in rich colors, is described as "probably Chinese work," despite the Sassanian type of medallion pattern. Andrews adds that the weave "being closer that usual and plain, with faint rib, suggests transition between older warp rib and twill." However, it is difficult to envisage a less complicated method of achieving the warp-rib itself than by means of a twill threading draft.

Andrews has illustrated the Chinese version of the warp rib by flat-view diagram.[20] The drawing is inaccurate since half of the number of wefts shown do not at any point interlace with the warps.

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20 Andrews, *Ancient Chinese Figured Silks*, fig. 17.

Mrs Sachs' flat-view diagram[21] furnishes a working model, but both the drawing and the accompanying explanation assume that in simple weaves round threads can be kept one atop the other like flat tapes.

The fabrics in Plate 5, A and C were woven according to Mrs Sachs' diagram reproduced here in Figure 2. Her setup consists of light warps, A, and dark warps, B. There is a light main weft, C, and a dark secondary weft, D. Following her lettering, A warps and B warps were alternated in warping for a plain four-thread twill as given in the accompanying threading draft.

	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Harness 4				B				B				B				B
Harness 3			A				A				A				A	
Harness 2		B				B				B				B		
Harness 1	A				A				A				A			
1 + 3, weft D	A		A		A		A		A		A		A		A	
2 + 3, weft C		B	A			B	A			B	A			B	A	
1 + 3, weft D	A		A		A		A		A		A		A		A	
1 + 4, weft C	A			B	A			B	A			B	A			B

Four passages of weft from selvage to selvage constitute a unit of repeat. These are shown in our draft together with the harness combinations forming the required sheds (openings in the warp plane). Thereafter the first pair of combinations, 1 plus 3 and 2 plus 3, alternates with the second pair, 1 plus 3 and 1 plus 4, throughout the length of the weaving unless interrupted by pattern motives. These, too, if in plain and twill weaves, could have been accomplished by various other combinations of the warps, for example those controlled by harnesses: 1 plus 2, 3 plus 4, 2 plus 4, etc.

Mrs Sachs' explanation of her diagram follows. The interpolations within brackets are occasioned by experience in weaving the short length shown in Plate 5, A.

A. The light warp threads seen on the face of the fabric; they pass regularly under and over one thread of the main weft, C, and at the same time over two threads of the secondary weft, D.

B. The dark warp threads, not in use on the face, but also interwoven with the main weft, C.

21 Sachs, *Notes on the Weaves*, fig. 1.

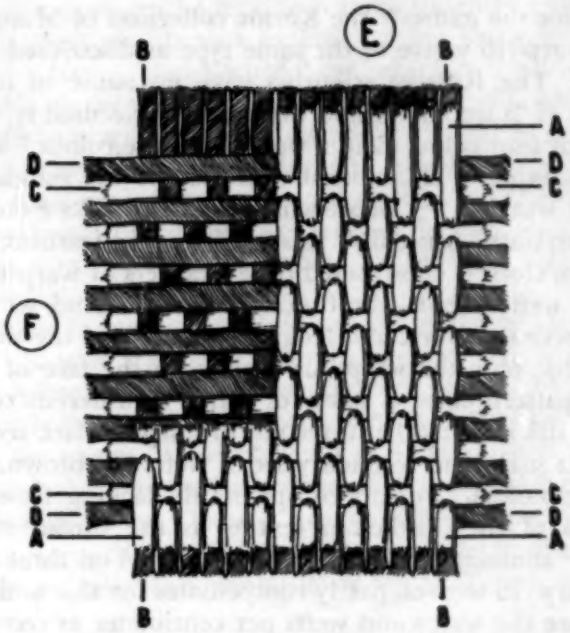

FIG. 2. Flat view diagram of Chinese warp-rib structure (after Sachs).

C. The main weft threads which are interwoven with the warps, A and B.

D. The secondary weft which never appears on the face of the fabric nor on the back, but lies between. A single thread of the secondary weft may be seen next each thread of the main weft, C. [The word "never" and the phrase "lies between" should not be interpreted literally. The dark weft interweaves over-one, under-one as in any plain weave. This procedure serves to carry all the dark warps to the back of the fabric (Plate 5, B), but they are kept in place by an equally dark weft. In the actual Chinese silks, the very fine threads corresponding to the dark warps and wefts of the construction are probably invisible except under magnification.]

E. Section of the fabric intact, showing cloth weave made by light warps, A, and main weft, C. In this area the dark warps, B, are carried on the back, and the secondary weft, D, is hidden by the light warps on the face. [This last sentence applies to the general effect. Actually, every dark warp is brought up to the surface with its light-warp neighbor on alternate picks and both should have been shown in the diagram, the dark warp as a spot crossing the light weft.]

F. Section with light surface warps, A, removed, showing secondary weft threads, D, and the place where the dark warps, B, intersect the main weft, C.

Except for the gauzes[22] the Kozlóv collection of Mongolian silks are all in warp-rib weave of the same type as discovered among the Stein silks. The Russian scientists gave no name to it, but they described it as "a well-made and wonderfully executed type of weave, with three or four colours and a weft of a single colour," adding that "it is an example of an unusual transition to the standard type of ornamental weaving."[23] Mrs Sachs' analysis of silks from Noin-Ula in the Pennsylvania Museum[24] lists its distinctive features, including: (1) that the cloth is constructed of several sets of warp threads and two sets of weft threads—the function of the second set appears to be to reinforce the fabric and lengthen the float of the warps on the face; (2) that only the warps are visible on the face of the fabric, hence the pattern consists solely of warps of different colors. The Mongolian silk analyzed has three sets of warps: a dark red set, a tan, a brown; its main and secondary set of wefts are brown.

One technological detail conspicuously lacking from Andrews' descriptions of the Turkestan textiles is the thread count. The tabulation[25] summarizing the material collected on three Mongolian silks, all warp-rib weaves, partly compensates for this omission. The following are the warps and wefts per centimeter as recorded:

	Mongolian Textile No. 13958a	*Mongolian Textile* No. 13958b	*Mongolian Textile* No. 14112
Warp No. 1	88.2	43.2	42.5
Warp No. 2 (of different colour)	——	——	42.5
Warp No. 3 (on the wrong side)	——	——	42.5
Weft	41	varies; av. 37.4	28.3

4. Double-Cloth, Gauze, Brocaded Weaves

Included among the figured silks are several pieces of double cloth. A double cloth is composed of two sets of warps and two sets

22 Kümmel, *Chinesische Kunst*, plate 47; Voskresensky and Tikhonov, *Technical Study of Textiles*, plates 8-9.

23 *Idem*, p. 7.

24 Sachs, *Notes on the Weaves*, p. 77 *et seq.*

25 Voskresensky and Tikhonov, *Technical Study of Textiles*, pp. 25-37.

of wefts. Each set weaves its own web independently except where the two are joined at intervals by making the yarns weaving the upper cloth exchange places with those weaving the lower cloth. Chinese double cloths are found woven in plain, twill, and warp-rib weaves. A Mīrān piece (3) has a "well-defined twill face, front and back cloths firmly bonded together." An Endere silk fabric (3), according to Andrews, appears to be a double cloth of fine even texture. He speaks of the "design worked out in diagonal weaving," but that may mean that the brocading rather than that the basic weave is a twill.

In the Ch'ien-fo-tung group there are a number of cloths of this type. One "silk satin fragment" (20) has a satin-twill face, a plain-weave back. A fine closely woven double cloth (21) is diapered with small concentric lozenges. The description states that the color pattern ignores the weave. Two fragments of a votive patchwork from the same site (19), composed of rectangular pieces of figured silks, are "true double cloths," loosely woven. The warps of both are fine stiffened yarns, the wefts broad, flat, soft. These show on both surfaces. Similar fragments were picked up at Toyuk and Kharakhoto.

Gauze differs from other woven fabrics in that the warp yarns do not lie parallel: every two warps cross each other between each passage of the weft, one of them always remaining above, the other always below it. This construction makes possible a strong although transparent textile because the wefts are held apart by the crossings of the warps. The majority of the Ch'ien-fo-tung banners are made of gauze. They are almost as numerous as the figured silks from the hoard.

Some of the gauzes, used before the entrances to cave temples, were printed or painted; some were embroidered. Designs were woven into the banners by grouping threads and varying the crossings. These areas contrasted with others done in plain weave. One of these pieces from Ch'ien-fo-tung (22) is illustrated. The "Descriptive List" records several others (23, 24, 25).

A number of gauzes are woven in the style shown by a Ch'ien-fo-tung fabric (26). It has a small lozenge diaper on an openwork ground. Usually geometric motives are attempted. Another silk

from the same site (24) has a lattice pattern with free-standing swastikas, rosettes, and quatrefoils.

Most of the gauzes from Khara-khoto are colored. One part of a silk from there (4) is, according to Andrews, "a sort of crazy gauze of stoutish yarn evenly woven with a sort of 'oatmeal' texture."[26] Another silk fragment (6) has a very even mesh, about 40 warps by 54 wefts to the square inch. Its unique feature is that it has been "coated with pigment, perhaps lac, and dried under pressure" resulting in a similarity to "extremely fine pierced zinc."

The only gauze from Lou-lan, Site C (10) has a checker pattern in blue, and brownish-yellow. The squares measure over two inches and the interweaving brings out solid blue and solid yellow squares, and a modified two-tone color wherever blue and yellow cross their opposites. Sachs remarks of the Noin-Ula silk gauzes that they are exceedingly fine.[27]

The gauzes from Astāna are not numerous and they bear resemblance to those in the Tun-huang hoard. A gauze from Astāna (22) is described as "rainbow colored." It is woven "in alternate open and close bands" [gauze combined with plain weave?]. The warps and wefts are in five colors; the result is a plaid in brown, yellow, ochre, red, blue.

Several of the so-called gauzes from Ch'ien-fo-tung are in reality woven by what is known in basketry as a "wrapped-twined" weave (Plate 6, C). This differs from the simple gauze in that pairs of weft elements, not warps, cross each other, and these elements not only cross but exchange places so that each is alternately in front of and back of the warp threads. Andrews thinks that the technique "is done with two shuttles at once, one shuttle passing under and the other over each 'end' of warp; between each stitch the shuttle threads are twisted together by one turn."[28]

Twining is an impractical method of producing cloth in quantity regardless of the procedure followed. We have many basketry forms and mats woven by wrapped-twining, but only a few garment materials. Two of the classic examples are those of the New Zealand Maori and the Northwest Coast Tlingit.

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26 Stein, *Innermost Asia*, vol. 1, p. 489.
27 Sachs, *Notes on the Weaves*, p. 76, plate 9; Kümmel, *Chinesische Kunst*, plate 47.
28 Stein, *Serindia*, vol. 2, p. 782.

Among Stein's finds there is the fragment of a cotton shoe from the Tun-huang Limes (7). It is finely woven to shape in the wrapped-twined weave. A Ch'ien-fo-tung "silk gauze" (27) is described as showing a very complicated form of twined weaving. Its texture is thick and soft. Other fragments similar to this were used for embroidery work because the open, firm weave, when reinforced with a plain backing, furnished a guide to spacing stitches of uniform length. Patterns similar to those embroidered on the plain gauzes were also executed on wrapped-twined foundations.

The word brocade does not designate a cloth having a particular weave but a cloth with supplementary warp or weft yarns for decoration (Plate 6, B). These are interwoven, usually at intervals, although they do not become an integral part of the basic material. They can be removed without destroying the fabric. Supplementary yarns may be carried across the full width to make decorative bands, or they may be introduced to form "spot" designs. Any type of woven fabric may be brocaded.

A white damask from Ch'ien-fo-tung (28) is brocaded with free-standing spots in apricot colored silk. Both ground and the inwoven damask figures are in twills, the floats running at right angles to each other. Other twills from Ch'ien-fo-tung (29, 30, 31) are brocaded with leaf and flower forms giving the effect of satin-stitch embroidery and spots in the shape of birds (?).

Andrews states that the use of a swivel is indicated by the brocading done on Ch'ien-fo-tung silks. In modern weaving, this is an attachment for the loom, a device that makes possible the introduction of brocading yarns in spots at wide intervals without the necessity of carrying these yarns from edge to edge of the fabric. In many descriptions of spot brocades, Andrews refers to the use of a swivel. However, present-day weavers on primitive contrivances have no difficulty in brocading free-standing spots without mechanical aids, and it may well be that comparable methods were known to the ancient Chinese weavers. The swivel is mentioned in descriptions of the above three twills from Ch'ien-fo-tung. In the first and third silks (29, 31) the supplementary weft yarns are cut off short on the reverse side of the material; in the second silk (30), the brocading yarns run warpwise of the material and are also cut off close to the figure. They are not inwoven with the warp, says Andrews,

but they pass over the twill ground in loose threads [floats], long or short, as required for the motives. In a Ch'ien-fo-tung silk (19), which Andrews terms a "true brocade," the ground is a small twill. Some of the colored cross stripes have inwoven decorations made by supplementary weft. These yarns are carried along the back of the material in bands and wherever required are brought to the surface for the pattern. There they float over their allotted spaces and again pass to the back of the web. Andrews states that some of the rosette motives are woven in twill like the ground. The piece, then is a brocaded damask.

The brocaded silks of the two types given exemplify the ordinary manipulations of basic and decorative yarns. One Ch'ien-fo-tung silk (32) is a brocaded twill like many others. The warps are very fine, the weft flat and untwisted. The supplementary weft, which is used for the floral motives, is carried at the back attached to the basic material only at long intervals and is brought to the surface to make the motive. At this point there is a variation in technique. The basic weft and the supplementary or decorative weft exchange places, but neither interweaves with the warp. They both float across the width of the flower petal, for example, and then return to their original positions. Wherever the flowers occur, there are three unconnected planes of loose threads. This same technique was used in several of the pieces forming a Ch'ien-fo-tung patchwork (19). If the floating decorative yarns are not cut off on the reverse side of the textile, the fabric may have been lined. Some show evidences of this.

TOOLS

A number of tools connected with weaving processes were found by Stein, but most of them were too heavy to suggest a use with silk. Included were heavy combs from Niya, a tool of doubtful use (but probably an aid to the spinner or weaver) from Tun-huang, and several sticks which appeared to be parts of heddles. The Tun-huang device (8) consists of two uprights about ten inches apart. To these were tenoned two cross pieces about two inches apart. Almost filling the space between them is a roller with a five-inch slit through it. The wood is well preserved.

Fragments of sticks interpreted as possibly heddles were found closely bound with cord at Murtuk, ruin M.B. (1). Attached to them

were tangled loops of buff woolen string of varying thickness made of five or six strands twisted together. "Later loops are merely threaded loosely on the sticks," says Andrews' description. These may have been additional heddle loops for a piece of weaving wider than provided for by the original heddle.

SURFACE TECHNIQUES

1. Stitchery

Embroidery, well represented in the Stein collection, adds decoration to completed cloth by means of stitchery. Of the variety of stitches found on the pieces, the chain stitch (Plate 7, D and L) occurs on fabrics from the greatest number of localities and periods. Embroideries from Lou-lan, Site C are exclusively in this stitch and exhibit the minute care typical of Chinese needlework. Among these is the embroidered comb case (9), previously mentioned. It is of crimson woolen rep lined, bound, and embroidered with silk. Naturalistic floral and vine motives employed in pieces typical of T'ang times show the greater freedom enjoyed by the needleworker as compared to that of the weaver. The motives have a very modern look. For Mongolian examples see Yetts and Kümmel.[29]

The few embroidered pieces from Astāna are usually chain-stitched on silk gauze, or occasionally on damask. The absence of satin stitch (Plate 7, H), so common among the Ch'ien-fo-tung embroideries, may indicate that the work found at Astāna was locally produced. The stitch characteristic of fabrics at this site is the buttonhole. One piece (23) is a fragment of silk gauze lined with muslin. Yellow and blue spots are worked through both thicknesses. A second fragment (24) is damask. It is embroidered in an allover pattern of thin scrolls curling out from disks. The scrolls are in chain stitch, the disks formed of a spiral line of buttonhole stitches (Plate 7, E). The needleworker was guided by a series of lines painted on the fabric in yellow. A third Astāna fragment (25) is distinguished by its pattern, a "stylized medley of leaves, flowers, four-pointed stars" and also by its shaded work in fine chain stitch. Shading of one color through its values, dark, medium, light, was often done by the embroiderers. They also blended one color with

29 Yetts, *Discoveries of the Kozlov Expedition*, plate B; Kümmel, *Chinesische Kunst*, plates 45-48.

another by interpenetrating one line of stitches with another, especially in satin stitch embroideries.

Although the embroideries of the Tun-huang hoard are usually executed on gauze in a solid satin stitch, one fine example (9) is in chain stitch on corded silk. The designs are composites of floral and other motives in a great variety of colors, proportions, and arrangements. The triangular headpiece to a Ch'ien-fo-tung banner (33) is silk damask. It is covered with fine stitchery to an extent of obscuring the woven pattern of the damask. The needlework is so beautifully done that the satin stitches appear as perfect on the reverse as on the obverse side. Andrews speaks of "long-stitch," which apparently is another of the several terms for stem or outline (Plate 7, B).

A Ch'ien-fo-tung gauze (34), also embroidered in satin stitch, is virtually invisible because the stitches are worked "solid on both sides." But if the two sides of a satin-stitch embroidery are not designed to be seen, then the thread is wasted because there is as much on one side as the other, besides making a heavy fabric. A stitch known to us as surface satin stitch (Plate 7, I) can give the same effect of solid work on the right side of the fabric. An embroidered gauze from Ch'ien-fo-tung (35) will serve to illustrate. The needle laces back and forth across the motive, picking up very small bits of cloth first on the far margin, then the near. The reconstruction shows the appearance on both sides. This shadow stitch is the form most frequently found in the Stein collection.

As mentioned earlier, gauzes make needlework simpler by furnishing a convenient gauge for the length of stitches, but since the texture is thin, lining gauze pieces before embroidering appears to have been the rule. In most instances the thread was carried through both fabrics, and frequently the gauze was cut away wherever not covered by the embroidery. A silk fragment from Ch'ien-fo-tung (36) shows the results. The silk gauze was faced with a coarser quality. The satin-stitch embroidery was carried through both layers. Then the coarser was cut away except for traces remaining about the tendrils and some parts not entirely filled in. The motives stand up from the ground in relief.

One very simple embroidery is a form of negative patterning, to judge from Andrews' description. The piece (37) is of thick purple

gauze lined with light blue and yellow silks. A flying bird motive was outlined with a running stitch (Plate 7, A) through the two layers; then the gauze was cut away within the outline. This procedure left the bird forms in the color of the backing silks.

Gold or silver thread was sometimes used to outline the pattern. A thick thread of white silk was covered by winding around it strips of paper covered with silver leaf (?). On most cloths this metal has now turned black or only the core thread remains. An embroidered damask cover, "of tea cosy shape" (38), has a design of flowers and leaves in satin stitch. The outlines were in silver thread couched with fine silk (Plate 7, F and G). Bird forms in gold thread were worked solidly in couching technique. Andrews likens the style of design to that of the T'ang period. Other cloths are found with design motives outlined by couched threads from which the gold or silver leaf covering has disappeared (Murtuk, ruin M.B. [2] and Ch'ien-fo-tung [4]). Gold paper outlines of a dragon form are couched with red thread in another Ch'ien-fo-tung gauze (27).

Of the needlework from Ch'ien-fo-tung, two large hangings are outstanding. One of them (39) is worked in solid satin stitch on a natural-colored linen faced with silk. The central figure, a life-size Sakyamuni Buddha, stands between Bodhisattvas virtually life-size. The workmanship is of exceptional quality. The second hanging (40) is a patchwork of small rectangles each centered by a seated Buddha done in solid chain stitch with untwisted silk. Evidently the pieces had been part of a larger hanging, possibly damaged. Salvaged fragments irregularly joined to form the patchwork suggest that the work is of fairly early date. The whole composition resembles wall decorations found in many Buddhist shrines in Chinese Turkestan. The general outlines of the figures still show dark brown thread in places, perhaps the guiding lines for the embroiderer's solid filling stitchery. Narrow spaces between color areas may have been originally occupied by couched strips of gold paper subsequently removed.

One of the most varied of simple embroidery stitches is the feather stitch (Plate 7, K). Like the twill weave, it has a number of established names: coral, chained, closed, knotted, single, double, long-armed or Cretan stitch, etc. When Andrews describes a Kharakhoto embroidery (4) as "worked mostly in a kind of long feather

stitch" any one of several might be indicated. An example of embroidery from Kara-khōja (1) is shown in the plates. There is an elaborate flower worked "in Chinese featherstitch" and outlined with a couched thread. In this instance the feather stitch looks similar to a satin stitch with corded edges.

Chinese knots (Plate 7, J) form the field for a chainstitched dragon in a silk from Noin-Ula.[30]

Quilting and appliqué come under the embroidery classification. Where it was the custom at burial to wrap the bodies with discarded garments as at Lou-lan and Astāna, a number of quilted garments were found. A buff silk garment from Lou-lan, Site A (6) is composed of several layers sewn together by parallel seams from one-fourth to three-fourths inch apart. A pair of shoes from Kara-khōja (2) are ornamented with appliqué-patterned bands slightly over an inch wide. Andrews describes the center of each as decorated with transverse silver threads couched with yellow "horsetail." We have no explanation for the last term. Yetts illustrates[31] a Mongolian quilted carpet.

The fragment of an appliqué band from Khara-khoto (7) is distinctly Oriental in composition. First there is the crimson corded silk ground material, then the appliqué material of gilded silk canvas mounted on thin paper. The dragon motive cut from the latter is outlined by a couched silk cord covered with gilded paper.

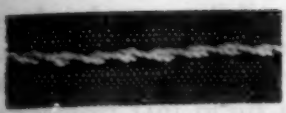
Patchworks are in a class by themselves. In the deposit of the Thousand Buddhas at Ch'ien-fo-tung there are a number of composite pieces to show that efforts were made by the custodians to preserve even the smallest votive fragments. One of these (19) is formed of various rectangular fragments of embroidery on red silk gauze backed with red silk, together with damasks and figured silks; the border is printed silk. Not only the surface side of the patchwork, five feet long by three and one-half feet wide, is a composite, but also the reverse side. The piece has a variety of backing materials: cream, brown, golden-yellow, light blue, sage-green silks, and in places a brilliant red linen.

A group of silks from Astāna are somewhat different in style. One (26), which may have been a garment, features squares of

30 Kümmel, *Chinesische Kunst*, plate 58.

31 Yetts, *Discoveries of the Kozlóv Expedition*, plates A, C, D.

A



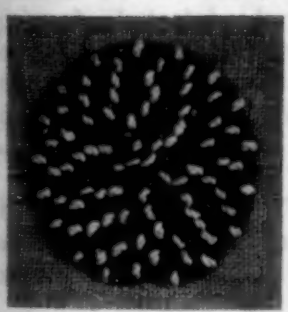
B

C

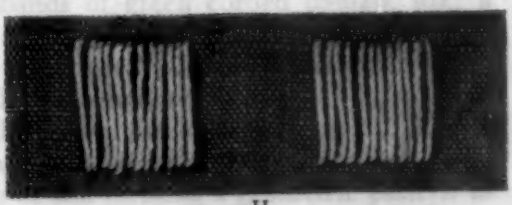
D

E

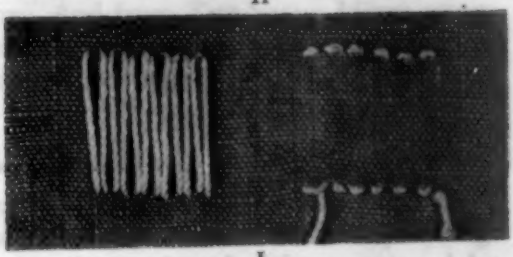
F



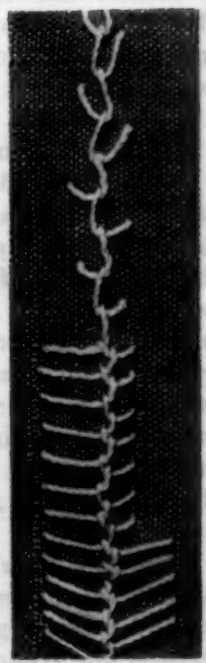
G



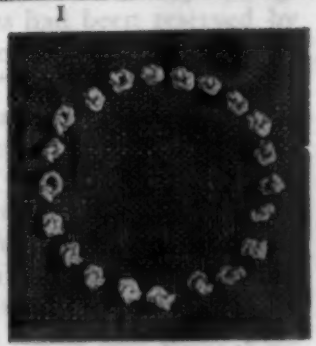
H



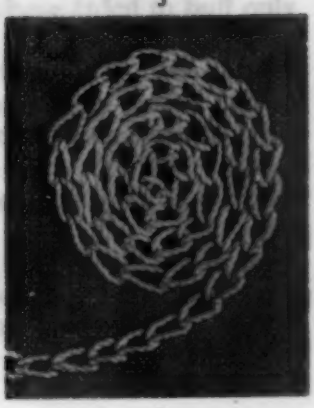
I



K



J



L

Embroidery Techniques

A, running stitch; B, outline, stem, "long" stitch; C, tent stitch; D, L, chain stitch; E, buttonhole stitch; F, G, couching; H, surface and reverse sides of motive in true satin stitches; I, surface and reverse sides of motive in surface satin stitches; J, knot stitches; K, various feather stitches.

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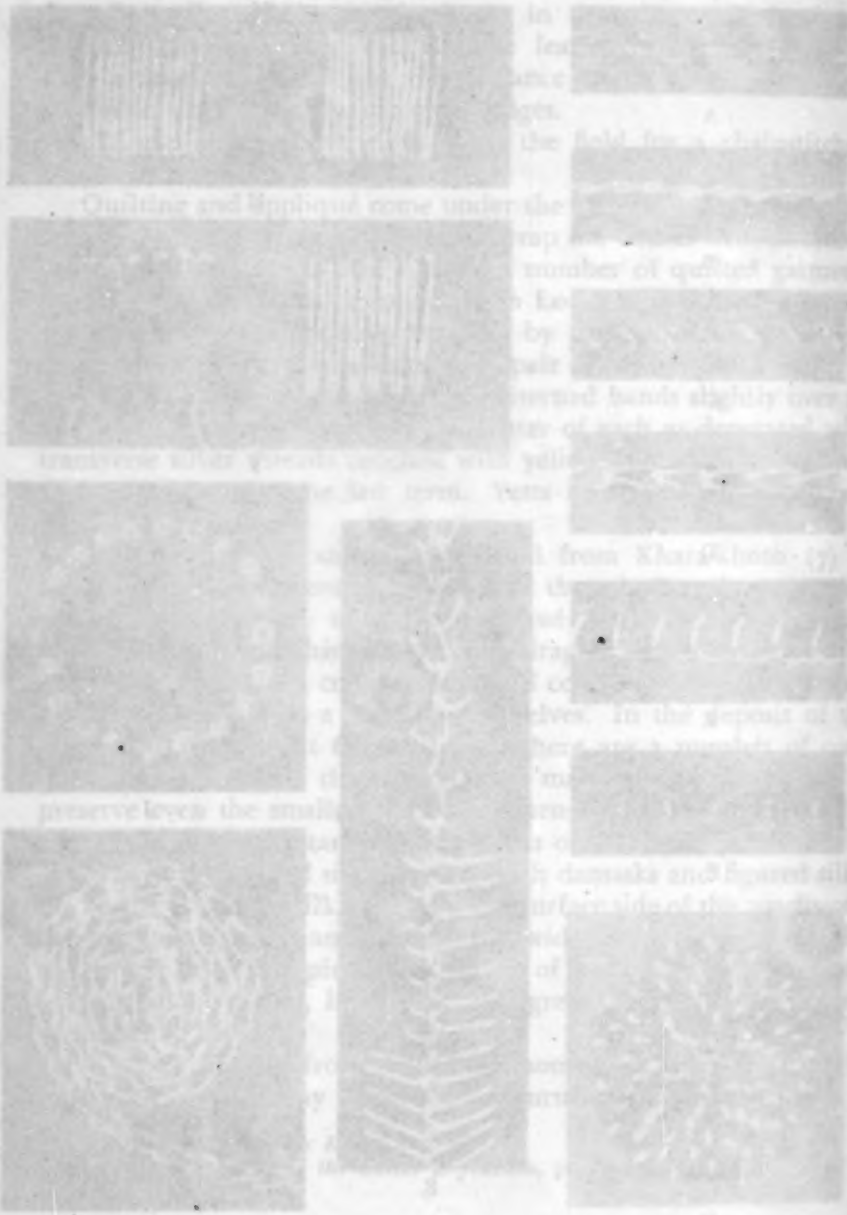

yellow damask divided by bands of green corded damask silk; a second (27) follows a similar plan with a combination of figured and plain silks. Two others (28, 29) are fragments of padded garments (?) made of plain color silks and printed silks.

From the earlier sites also come patchworks. Lou-lan, Site C produced two small lined bags (11). The outside material is made up of small triangular pieces of silk forming a geometric pattern in white, green, red, blue, yellow. And from Tun-huang Limes comes a fragment (10) of silk showing in its present condition remnants of about a dozen pieces. The strips were roughly joined figured silks in indigo and yellow-green.

2. Printing and Dyeing

Color has been applied to the Turkestan textiles in several ways: directly by painting, by means of blocks or stencils, and by dyeing. Fabrics were also dyed after certain portions had been reserved by applying to them substances that resisted the dye, or by the method known as tie dyeing. Andrews speaks of "knot dyeing," but his description does not fit the term as customarily used. Because the painted textiles are most ambitious in composition, they are commented upon last.

Some of Stein's silks, including several from Khara-khoto (8, 9), were block printed. Probably a carved wooden block like those used in printing paper was used. Fragments of silk found at Toyuk (2) are patterned with naturalistic peonies and other flowers in an allover design. The black with which the leaves and stems were printed has remained fast. The other colors have faded to buff only slightly lighter than the buff ground color. The block impressions measure about five and one-half by nearly five inches. An Astāna printed silk (30) has large and small rosettes in green-blue and pink on yellow ground. For this allover pattern two pattern blocks seem to have been necessary. A second Astāna printed silk (31) was calendered after printing, a procedure which blurred the outlines of the design.

Several silks in the Tun-huang hoard (41, 42) appear to have been block printed. The only fabrics described as stencilled are among the Ch'ien-fo-tung banners. Streamers are patterned with natural motives such as insects and flowers. The materials used are

described as "heavy, greyish-black paste" and "black and whitish glazed paste."[32]

Resist printing and dyeing are done by applying a wax or paste with a block or stencil or free hand. When the cloth is immersed in the dye, the areas reserved with the dye-resistent materials are left the original color of the fabric. Many prints of this type occur in the collection, most of them from Astāna sites. One, a blue silk bag (32), has a delicate floral pattern which apparently was composed free hand. Floral motives prevail. An illustrated silk (33) is crimson with lozenge pattern in yellow. This combination indicates that the silk was twice dyed, first yellow, before the resist material was applied, and then red.

Two Astāna silks (34, 35), and a blue and white cotton cloth from Endere Fort (4) are listed as "knot dyed." Andrews uses the term to describe "a peculiar technique . . . still largely practiced in Northwestern India."[33] The patterned areas of the cloth are reserved by wrapping string around bits of the material pinched up by the thumb and forefinger. A small point of cloth of necessity remains unprotected and takes the dye. The distinguishing feature of this form of reserve dyeing is the pattern of roundish white spots centered by small dyed spots on a colored ground.

Andrews lists a large group of silks simply as "printed." No conclusion can be drawn as to methods used, especially for those pieces not illustrated. Printing and reserve dyeing were not limited to plain-weave silks; they were done on damasks and gauzes also.

Many of the decorated silks have been painted. First considered are those with pictorial decorations such as the shrouds and wall hangings from Astāna. One of the latter (36) from the wall of a tomb is composed of three widths of fine-textured vari-colored silk with boldly painted figures of the legendary Emperor Fu-hsi and his consort Nu-wa. They are represented with human torsos covered by a skirt common to both figures and terminated by two intertwined serpentine bodies. Some parts of the painting are outlined in black. The subject was apparently a favorite. It is found on two wall hangings, a blue silk painted in brown, white, and black (37), and a second similar in style (38). A third Astāna painting (39), on silk

32 Stein, *Serindia*, vol. 2, pp. 1006, 1032.
33 Stein, *Ancient Khotan*, vol. 1, p. 430.

of muslin texture, covered a coffin. A shroud of indigo colored silk (40) was also decorated with a picture of Fu-hsi and his consort, their serpentine bodies in strongly contrasting red and white.

Two other Astāna shrouds (41, 42) are hastily painted silks showing almost life-size heads of human figures, probably legendary characters. The palette for all of this type is limited to few colors.

A painting which excited considerable interest and which unfortunately is now in fragments was analyzed by Lawrence Binyon in the Burlington Magazine.[34] The Astāna hanging (43) is of silk bolting cloth. The composition of subject matter is too complicated to be analyzed in a study of this length, but it presents a great contrast to the usual hangings and painted shrouds of the T'ang period. The work is skillfully done in a wide range of colors as will be commented upon under that heading.

The banners of the Ch'ien-fo-tung hoard comprise the largest of the groups of pictorial paintings. Banners were used as votive offerings, and although in the Chinese style, undoubtedly were produced locally for the many visiting pilgrims. With the exception of the larger hangings, which may have been made to order, banners were made for the market. The subjects depicted are Buddhist divinities in characteristic poses and certain events in Buddha's life. In addition to silk employed extensively, linen and paper were used. The choice of material seems to have influenced the care with which the banners were decorated. If the banner was designed to hang free before the entrance of the shrine, it was painted on both sides, a comparatively simple process since the ground material was fine transparent gauze.

Stein states that with one exception, and that a Ch'ien-fo-tung banner "unmistakably Tibetan in style,"[35] the paintings are all water colors. The Tibetan piece (43) is in "tempera on a waxy ground over canvas." The banner materials were first impregnated with a size or alum to aid the color to spread uniformly, and to prevent the thinner colors from spreading. In Andrews' note on methods he speaks of the "vehicle for the pigment being water with a medium added as binder."[36]

34 June, 1925.
35 Stein, *Serindia*, vol. 2, p. 846.
36 *Ibid.*

A gray gauze banner (44) had been entirely coated with a "silvery white paint or glaze."[37] The design was then applied to the prepared fabric by "pouncing through a pricked cartoon"[38] or by tracing from a pattern if the silk was transparent. Pounce bags, pricked cartoons, partly completed banners, repainted and reused banners, have all been uncovered in the Ch'ien-fo-tung deposit. On the incomplete banners the tracing is occasionally visible on both sides of the gauze. Tracing accounts for the great similarity among certain of the banners. Outlines were brush-drawn with gray paint on light silks, and with flesh colors on the dark ones. Ground color was put on thinly, then given a glaze of transparent size. Finely ground pigments gave the water colors greater "covering power." White of great purity is found mixed with nearly all the colors. It may have been made of a stone still in use in the East or of calcified oyster shells like those used in T'ang times, since white paint with a lead base is discolored by age. The first colors were laid on in masses and the areas shaded or tinted. The outlines of the composition were then painted in by a skilled draftsman, judging by the fine brushwork. Final touches on the banners were undoubtedly executed by an expert hand even though the earlier stages may have been entrusted to the apprentice or novice. Often, Andrews notes, the guide lines are ignored by the painter responsible for the final touches.

Despite the wide range of colors, including gold, used in the paintings, few of them are inharmonious. The colors in the red-to-orange group predominate, embracing almost a third of those used: next most frequently found are the hues in the orange-to-yellow group; and third are the blue-green-to-blue colors. White is an important feature of many of the compositions.

Pictorial banners were found at sites other than Ch'ien-fo-tung. At Khara-khoto were discovered remains of similar paintings, probably votive. The subject matter is also Buddhist. At Khādalik three fragments of paintings of the same type and at Sampula one fragment were uncovered. Banner fragments in the collection came from Toyuk, Kara-khōja, and from E.G., a site near Khara-khoto.

Painting on some of the silks consists of floral and geometric

37 *Idem*, p. 944.
38 *Idem*, p. 846.

motives like the running scroll. Designs of this character on the banner accessories are not unlike the printed designs and combine successfully with figured silks and damasks. The non-pictorial paintings lean heavily on naturalistic motives: the stems, leaves, flowers. Some are described as "stamped,"[39] probably meaning printed, with neutral colored pastes. Others were stencilled and block-printed.

Several non-pictorial paintings come from Astāna. One, a fragment of a miniature "sleeve" (44), has rosettes, petals, and other floral motives painted on it; another is a fragment of lustrous white silk (45) with broad bands and chevrons in black paint.

There are a few references to finishes that were given to woven and decorated materials. Some of the Ch'ien-fo-tung silks show signs of having been calendered, a process which smooths the fabric surface, usually under considerable pressure for the purpose of giving it gloss. In general, the pieces so described are undecorated, plain-weave silks. An exception, already noted, is the Astāna printed silk (31) with blurred pattern. Glazing, also mentioned previously, was done to the plain silks and to damasks; size might be applied to whole damask pieces or to the warp threads only.

COLORS AND DYES

Andrews' many appreciative comments on the "fresh" colors in the Stein silks do much to aid in visualizing their striking beauty. He speaks of the "rich and splendidly preserved" colors in a patterned fragment of Sassanian type,[40] of a "dark pattern" in which three or four different greens are shaded by being "broken one into the other;"[41] of a Lou-lan, Site C color harmony (7) that "rings the changes on blue and pale brown without observing any regular sequence."[42] He points out that in an Astāna painting on silk the "black outlines are often softened by a gray line below or beside them."[43] On the less fortunate side, Andrews calls attention to the fact that some pigments appear to have had a corrosive effect on the fabric as evidenced by the edges of an accurately drawn motive which

39 Stein, *Serindia*, vol. 2, p. 944.
40 Stein, *Innermost Asia*, vol. 2, p. 697.
41 Stein, *Ancient Khotan*, vol. 1, p. 441.
42 Stein, *Innermost Asia*, vol. 1, p. 249.
43 *Idem*, vol. 2, p. 692.

has fallen away. There are, too, references to "uncertain" colors, and discolorations affecting the dyed hues.

Any attempt at analysis of the colors used for both structural and surface decoration—including paints and dyes—is limited in scope by the nature of the available information. Although the textile analyses are detailed and the variety of color names shows careful observation on Andrews' part, the actual hue designated by the name is known to vary with the times. In general, however, colors bearing the same family name fall within the same section of the spectrum. Another factor to consider in tallying the number of hues is that the dyes almost surely have changed with age or exposure. Since a great number of the retrieved cloths had been subjected to weathering, we must assume that many colors have faded or disappeared entirely. Among cloths dyed with natural dyes, fading does not necessarily take a color out of its original family group.

One color among the Stein silks indubitably affects the percentages: buff, which falls within the orange-to-yellow group. There are approximately 625 instances of its use, only eight of which are listed as paints. Frequently the whole remnant or piece is plain buff, and because silk yellows with age and raw silk has a yellowish tint, a great portion of the colors called buff probably are undyed.

Maerz and Paul's color classification was followed in allocating the named colors to one or another of the groups. The results in percent are listed below:

Red-to-orange	24	Blue-to-red	3
Orange-to-yellow	29	Purple-to-red	5
Buff	12	Black	5
Yellow-to-green	13	White (includes white spots in resist prints)	7
Green-to-blue-green	1		
Blue-green-to-blue	13		

Almost nothing is written concerning the sources of the pigments used in the printing, dyeing, and painting of the Stein silks. Asia has had from ancient times great quantities of vegetable dye stuffs, but their full contribution to Stein's recovered textiles has not been determined. According to Chinese literary sources, saffron was produced in one of the valleys near Khotan. At Lou-lan, Site A, dried

flowers resembling saffron were found tied up in a small piece of woolen cloth (7). A lump of yellow ochre, probably for pigment, came from So-yang-cheng, and from watchtower T.VIII a padded block possibly used in the preparation of paint.

The Russian scientists, applying new methods to their research, made some progress on the problem of dyes. The Kozlóv textiles were in a bad condition and chemical analysis yielded only a few general indications. The specialists discovered the presence of iron, perhaps used as mordant prior to dipping the cloth or thread in vegetable dyes.[44] Some colors were detected by spectro-photography, a method recommended highly.[45]

Generalizing broadly, dyeing in those remote times must have been accomplished with vegetable dyes, mineral dyes, and animal dyes (cochineal). Deep brown shades may have resulted from iron compounds and also from extracts from plants, barks, roots, etc. Madder with alum mordant seems to be indicated by one sample.[46]

A red cord applied to a woolen carpet in the Kozlóv collection was the object of considerable attention by the Russian group. The color "a luscious bright red (colour of the red Turkish fez)" was apparently closer to the original than most of the others. The principal material used for the red was found to be the root of madder *(Rubia tinctoria)*. Study of the paintings brought to light during the Khara-khoto excavations revealed the use of madder in the red parts. The technique of dyeing with madder is complicated, and its use marks a people of high culture.[47]

An analysis of the warp and weft threads in the three Mongolian silk fabrics previously cited is recorded as follows: Warps Nos. 1 and 3, dyed beige, were dyed with vegetable dye after treatment with an iron mordant; warp No. 2 dyed brick-red by a mineral dye obtained from iron. The colors and dyes of the wefts were the same as those cited for the warps.[48]

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44 Voskresensky and Tikhonov, *Technical Study of Textiles*, p. 7.
45 *Idem*, pp. 7, 8.
46 *Idem*, pp. 13, 14.
47 *Idem*, pp. 55-58, *passim*.
48 *Idem*, pp. 29-35, *passim*.

DESIGNS AND STYLES

The pattern motives appearing in the Stein silks are of great archaeological interest, for as components of art styles they are a key to the influences of one civilization upon another. These textiles found on or near the ancient trade routes linking the East and West furnish clues to the extent of artistic penetration. In this paper only a brief summary of the typical designs and descriptions of the most noteworthy is presented. An analysis of the motives and their probable origins is a problem for the student conversant with the arts of regions from China to the Hellenistic West.

In examining the Ch'ien-fo-tung textiles and preparing the drawings and reproductions, Stein and Andrews asked the advice of Professor Strzygowski. He had been the first to note the wide influence of Persian fabrics on the arts of Southern Europe, and had predicted that future findings would link the motives of the Far East with those of Persia.

The weaving technique lends itself to the use of certain types of designs. Simplest are the stripes, plaids, and checks resulting from a variation of color in warps and wefts. The angular geometric patterns in twill weaving—described by Andrews as "the most valuable of all weaves from the designer's point of view"[49]—are the outcome of thread interlacings in the production of fabric. Crossing diagonals (the twill wales) produce the lattice or lozenge, with their concentric variations. A distortion, and often a pleasing modification of the original design, may occur through miscalculating the number of threads necessary for a unit, or by too loosely or too tightly battening the wefts during the process of weaving. Through these procedures the unit may be elongated in one or the other direction. The headpiece of a painted Ch'ien-fo-tung banner (45) and a manuscript roll cover (6), both of figured silks, illustrate his point.

The "stepped" effect has been spoken of in connection with the polychrome figured silks. It is a conspicuous feature if the weft yarn is disproportionately large in relation to the size of the warps, and these are somewhat spaced. A fabric woven with such a combination exhibits curves composed of a series of right angles which may occasionally stylize or distort the motives almost beyond recognition

49 Stein, *Innermost Asia*, vol. 1, p. 233.

as in a Ch'ien-fo-tung silk (46). The illustrations of other silks from the same site (47, 15) show the same feature.

In general, the design motives can be classified as naturalistic or geometric. The animal and flower forms are rendered in varying degrees of realism. Floral motives, which form a sizeable proportion of the Astāna designs (dating *ca.* 550-860AD), tend toward less naturalism than those on the Tun-huang silks. This may indicate that as early as the seventh century the tendency toward the naturalism seen in Chinese art of the T'ang period had not yet become prevalent. At Lou-lan both realistic and stylized floral forms occur, forming a group far more numerous than that of the geometric motives. Animal forms, whether real or fanciful, exhibit the designer's amazing ability to observe and depict movement which is typical in Chinese art since Han times. Many of the fabrics recall motives from the Han tomb sculptures. Birds are the most frequently occurring living motives to be found in the Ch'ien-fo-tung and the Astāna silks. A favorite floral design in silks from the latter site consists of bands of rosettes combined with borders of leaves; the arrangement resembles some of the designs from Tun-huang.

Geometric designs are found in the textiles of all the rich sites. At Tun-huang the diaper patterns of lozenge forms and repeating spots occur most often. The latter consist of rosettes, chevrons, hexagons, scrolls, and the like. The simplest of these motives are found principally among the monochrome silks, the damasks and gauzes of Ch'ien-fo-tung and Astāna. The preference for plain allover patterns is undoubtedly connected with the facility with which they develop as an outcome of weaving techniques. The patterns of the gauzes are severely geometric although those of the damasks are often floral.

Fewer patterned gauzes and damasks show Western influences than do the polychrome figured silks. The motives, some of which appear at first glance to be Sassanian, can be traced back to silks of Han times. Natural forms are usually incorporated with spot or diaper motives to compose more complex patterns. This last is especially true for the printed silks.

Among the Lou-lan silks, dating from Han times, the allover lattice or lozenge diaper is a dominant motive. Spot patterns do not appear, although they are conspicuous among the later silks of T'ang

times. With few exceptions two colors are the rule. One of the most elaborate is a dark buff damask from Site C (12). It approximates an allover of the lozenge type. Within each frame is a pair of confronting animals, "a motive frequent in our early Chinese silks and easily accounted for in textiles of whatever period and origin by the convenience which the 'turn-over' method, by producing symmetrical figures, presents to the designer."[50]

The vast majority of designs on silks in the Stein collection either are of distinctly Chinese style or they employ motives which appear not to have been modified by foreign influence. The origin of many of the silks can be ascertained not only through the type of motives and the Chinese characters forming part of the pattern, but also in some instances by the occurrence of the warp-rib weave which the authorities consider unique. A much smaller proportion of the Stein silks show the characteristic features of textiles either produced in the Near East during the period of Sassanian rule, or produced by local imitators.

The earliest of the Chinese-type silks are from Lou-lan; all the designs on them are of Chinese origin. To find these so far to the west is testimony of the powerful influence exerted on these regions by Chinese textile art. And, since these fabrics were produced several centuries before the Sassanian period (226-641 AD), the Lou-lan motives of Han times well may have been the forerunners of the Persian motives. Strips of joined figured silks, indigo and yellow-green in color, from Tun-huang Limes (10) date from Han times. Like the ancient Lou-lan fabrics this textile has the allover diaper as background for pairs of dragons confronting pairs of phoenixes. In addition there are ogre heads, pairs of birds placed feet to feet, bosses, and cloud scrolls, very symmetrically organized in relation to the squares of the diaper.

A distinctive pattern of some of the earliest silks shows a processional arrangement of figures. A Lou-lan, Site C fabric (2) emphasizes cloud scrolls with lions and winged beasts marching across the width, all in one direction. A second fabric (13) has grotesque beasts pursuing one another; and a third from the same site (14) features a horseman and rampant beasts. Some silks of this pattern style include among the design motives Chinese charac-

50 Stein, *Innermost Asia*, vol. 1, p. 238.

ters; occasionally the selvages are decorative (13). Andrews makes an interesting observation: there is only one example of cloud and beast patterns repeating in the width of the fabric.[51] One has an increased respect for the skill of the ancient weavers upon reading that the ogre pattern unit in a Lou-lan, Site C fragment of figured silk (15) is under an inch in height.

Many of these early Lou-lan, Site C silks are patterned mainly with cloud scrolls and floral motives. The phrase "stepped scroll" (16) suggests fine warps and broad wefts. The description of one (17) reads that there are "no true animals" and only a "remote resemblance to a bird."[52] The difficulties of rendering intelligible a description of an involved pattern as a whole are amply illustrated by the following phrases lifted from the details concerning a figured Lou-lan silk (18):

> The pattern is so involved and details so stylized as to be almost impossible of description. The largest element is a band about ¼ inch wide. . . . All drawing, excepting that of flowers, is fantastic, and it is quite easy to fit other interpretations to various parts of the design.[53]

Designs of Chinese origin are also dominant in the Ch'ien-fo-tung silks, one of which is dated 939 AD in its inscription (48). This is understandable when the geographical position of the site and the contemporary art influences are considered. One silk brocade (29) with prominent twill ground is brocaded with free-standing bird motives in twill at right angles to that in the ground. Another from the same site (49) is a figured silk with pattern of volutes and flowers.

Many of the Astāna silks are of uncertain origin because their design motives furnish no clúe, but there is a group that can be quite confidently designated as Chinese on the basis of their warp-rib weave. One of the silks (18), to be classed with the Lou-lan fabrics owing to its similarity in style, has pairs of confronting birds set in arches. Above and below the arcading are tiers of stylized leaves, flowers, fruits. Arches are design elements in the patterns on silks from other early sites.

Fabrics bearing designs of Western origin are of particular inter-

51 *Idem*, p. 253.
52 *Idem*, p. 252.
53 *Idem*, p. 246.

est because they throw light on the transmission of art motives. Typical Sassanian designs are characterized by the round or oval medallions framing confronting animals, hunting scenes, and the tree of life. The treatment of all the woven figures tends to be severe. Among the polychrome silks of the Tun-huang hoard Chinese designs and workmanship are absent, but there are several silks with Sassanian designs, believed by Stein to indicate Western origin. Silks with Sassanian patterns were produced in China and are found among textiles made as early as the middle of the eighth century AD, but textiles from Persia must have been brought to China during T'ang times (618-907 AD). Stein believes it probable that the fabrics walled up at Tun-huang were woven in an area east of Persia, in the great industrial art centers of the Sogdian region, which developed through years of trade with China. He assumes that the Ch'ien-fo-tung silks were transported through Central Asia.

A typical example of the medallion-patterned silk is a silk manuscript-roll cover (6). A pair of winged lions on palmette base center each frame, and small conventional panels and rosettes fill the spaces around them. The forms are severely drawn, the stepped outlines adding to the impression of rigidity. Two banner tops (45, 50) are similar in style.

Most of the polychrome silks used in making the Astāna face covers, probably manufactured in the West, show pure Sassanian designs. One example (46) has medallions with encircling pearl borders each of which frames a highly stylized boar's head. The whole composition is woven with stepped outlines.

Locally produced textiles showing Western patterns occur both at Astāna and Ch'ien-fo-tung. Western designs were even imitated in a few of the printed silks at Tun-huang. Two of the most characteristic local imitations of Persian styles are illustrated. One of them (51) has small circular medallions less than an inch across. Each encloses a pair of confronting ducks; the tiny spaces around them contain rosettes as fillers. Andrews comments on the extreme smallness of the scale, the close texture of the silk, the finely spun yarns. These features set the piece apart from others of the type. The second piece is a printed silk (41). The medallions measure twenty-one inches across. They contribute to a composite Chinese-Sassanian pattern. The Chinese style is evident in the semi-natural

treatment of the central flower and the geese; the circular frame with its embellishment of disks is distinctly Sassanian. The silk is of superior quality, the workmanship painstaking—two features suggesting a Chinese origin.

A silk banner with printed sections (52) has been interpreted as showing the transformation of a Sassanian model through Chinese workmanship. The medallions are characteristic. Each encloses central stylized trees and a pair of confronting deer. The Chinese contributions are the masses of foliage filling the spandrels between contiguous medallions and the cloud scroll instead of the expectable palmette base beneath the animal's feet. An amusing silk (53) shows stocky Tibetan ponies in place of the usual high-spirited Sassanian horses. Stein points to a number of influences exerted on Tun-huang by the nomads of the area surrounding the town. The width of this silk is the usual twenty-one inches and the confronting ponies occupy its full breadth. Each pair is directly in line with the pair above.

Astāna silks of Chinese origin exhibiting Western influence are also to be described in terms of pearl-bordered medallions and enclosed confronting figures. A fragment of figured silk (47), which Stein says is "probably Chinese work,"[54] has pairs of winged horses as the central motive. A second example (48) has pairs of phoenix birds.

SUMMARY

The material presented by Sir Aurel Stein and his several associates is sufficiently rich to permit drawing certain broad generalizations concerning Central Asian silks of the first ten or eleven centuries of our era, and to begin to outline some of their features in detail. Necessarily any such outline is lacking in many of its most important aspects by reason of the blanks left in even the fullest information on archaeological textiles. We can know virtually nothing of procedures, and ordinarily too few significant tools are available to aid in a tentative reconstruction of methods. The vast majority of the Stein silks were transported to their final destination, a fact which places an insuperable obstacle in the way of the analyst.

The bulk of the longer descriptions in the "Lists" attempt to make the reader aware of various pattern arrangements, characteris-

54 Stein, *Serindia*, vol. 2, p. 708.

tic motives, and design units significant in reconstructing the cultural influences meeting and mingling in Central Asia.

According to their presumed place of origin, Stein classifies designs as Chinese, Persian in the Sassanian style, and Chinese imitations of the latter with the inevitable modifications expectable at the hands of local weavers. In the first group fall most of the Ch'ien-fo-tung fabrics; in the second fall the polychrome figured silk face covers found on the Astāna dead. The third group has representatives among the textiles from both sites.

Ancient trade routes dating from the last centuries BC to the present time have played a vital part in the interchange of cultural influences between India, Western Asia, and the Far East. During some periods, China was aggressive in expanding her power; she overcame serious obstacles by means of trade contacts, military force, and to a minor degree, by religious missions. When trade with China was at a low ebb, as it was during the period of the Tibetan conquest of the Tarim basin (8th century AD), the refuse heaps at sites like Mīrān Fort registered the fact. The recovered fragments are old, torn, and withal, scarce. By contrast, when trade, and by implication cultural interchange, was brisk and regular, there was an abundance of silk materials available. In the 8th and 9th century, Tun-huang was on a main, perhaps the sole route between the silk provinces of China and the western regions. That circumstance—for silk was not indigenous—explains the predominance of silk fabrics among the textile finds.[55] Stein[56] elaborates on the administrative and industrial relations between the Far East and Central Asia especially during the Han (206 BC-220 AD) and T'ang (618-907 AD) dynasties.

Each region in its contacts with the others received and gave something tangible which was to greater or lesser degree reflected in its textile art. Among the most frequently encountered traceable influences from outside Central Asia are the Buddhist. Chinese records and the writings of pilgrims contain the evidence of teachings and practices which spread out from India to the other regions. The ruins at Dandān Uiliq, dated the 6th to 7th century, produced among other artifacts images, frescoes, articles of painted wood.

55 Stein, *Innermost Asia*, vol. 2, p. 895.
56 Stein, *Sand-buried Ruins of Khotan*, vol. 1, chapter 17.

Some of the conventional treatments of face, costume, and the decorative motives in these finds and the painted banners from Tun-huang are familiar from discoveries at ruined Buddhist monasteries on the northwest frontier of India. At Niya, Stein found what he calls "the most thorough proof"[57] of the influence of Indian art upon ornamental wood carving. Certain carved motives are common to the Central Asian textile art as well. He speaks especially of the four-petalled flower forms known to Indian artists in the earliest centuries of our era.

During these centuries, also, the influences of classical Western art came to Central Asia. The evidences of its arrival are clearly to be recognized in a series of seals impressed on the clay still adhering to many of the ancient documents. The figure of Pallas Athene and various portrait heads modelled after conventional styles are telling proofs of origin. If there be doubt concerning the reception and adaptation of Western designs by Chinese silk weavers, there can be none in the case of the wool weavers, presumably the local craftsmen. One of the most surprising and yet typical fragments is a Lou-lan tapestry showing the right side of a human head of true Western type.[58]

The most noteworthy Persian influences on Central Asian textiles and the most readily identifiable are those in the field of design. The medallion form with decorative borders framing countered animals and the numerous small details conventionally organized as space fillers are distinguishing features of the design complex usually designated as Sassanian.

The Chinese style of decoration relies, as do all others to some extent, upon geometric units. These are manifestly ancient in origin and in weavings can be correlated with the techniques out of which they develop. Some were common to silks from many of the sites; others were unfamiliar or not in favor. For example, the repeated free-standing spot does not appear in Lou-lan silks. Motives from nature are found at all the major sites although the Astāna renditions tend to be very formal. Besides these elemental motives, the Chinese style has a number which are distinctive, including crossbands of

57 *Idem*, vol. 1, p. 334.
58 O'Neale, *Survey of the Woolen Textiles*, p. 422.

bird and animal figures, undulating lines, volutes, and cloud scrolls, creatures of the winged chimera-type, Chinese characters.

The silks from Astāna sites are of particular interest. These 7th-8th century fragments belong to a period when trade between China and Central Asia flourished. Astāna, near Turfan, was at a crossroads, and its silks took on a cosmopolitan quality: some are typically Chinese in feeling and motives; some are Sassanian in their manner of composing the pattern.

Concerning the silk finds in particular, they are not only varied in type, but they give evidence of the many uses to which silk was put. On occasion it was combined with vegetable fibers, wool, even bamboo slips. Unwoven materials such as the silk waste for padding, felts, yarns, and cords were found; a roll of new silk was recovered. Whole garments are rare in the collection, but fragments which served as burial wrappings are plentiful. Votive silks represent a large part of the collections. These comprise the banners, from Ch'ien-fo-tung, artificial flowers, altar valances, and fabric scraps of one or another use. Silks used for writing material form an important group of the finds.

Structural techniques employed to produce these silks are also varied, and many of the pieces exhibit remarkable skill. From the painstakingly written "Descriptive Lists" over a dozen weaving techniques have been assembled and reconstructed. The simplest cloths were in the plain weaves: the reps, cords, stripes, plaids. A few silk tapestries were woven for special purposes.

The twills, frequently referred to as sateen and satin twill, are characterized by long glossy floats on the surface of the fabric. Few of the simple twills are in monochrome cloths. Modified forms like the herringbone and broken twills are combined in weaving damasks and polychrome figured silks (Andrews' division of the two is based largely if not wholly on color). Typical damasks have plain-weave grounds and twill-weave design motives. The two strongly contrast not only in technique but also because the exposed weft yarns in the form of twill floats are flat untwisted yarns which reflect the light. Warps are usually fine and hard twisted, thus they entirely lack lustre. The earliest fabrics classified as polychrome figured silks are woven in twills and warp-rib weave, a transition weave according

to Andrews. All the silks from the early sites at Lou-lan and the Tun-huang Limes are in warp-rib weave.

Among the structural techniques less frequently encountered are double cloth, which the Chinese developed in plain, twill, and warp-rib weaves, and gauze. The latter and its distant relative wrapped-twined construction were found in considerable quantities in the Ch'ien-fo-tung painted banners. Gauze also forms the foundation material for some of the embroideries.

Most elaborate surface decoration is characteristic of many of the Stein textiles. From Andrews' use of terms with established connotations, it has been possible to assemble about a dozen stitchery techniques. Each must be regarded as one of possibly several forms known by the same name. Inquiry and some search through embroidery books has not been successful in determining which of the feather stitches Andrews had in mind as a "Chinese" feather stitch. One glance at the cloths would be sufficient to clarify several puzzling terms.

Embroidery, sometimes with gold and silver threads, was done in the basic stitches, especially chain, satin, buttonhole, knot, couching. Chain stitch, the most frequently used, is the one stitch on the Lou-lan, Site C textiles. Appliqué and quilting appeared at different sites.

The application of color to the surfaces of woven cloths is exemplified in the block-printed fabrics, the stencilled fabrics, the tie-dyed cloths. Designs painted by hand are largely confined to the votive banners. Painted, block-printed, and figured silks might all have been assembled to make a banner and its accessories. Some of the pictorial subject matter has defied description, according to Andrews, but his patience and skill in setting forth the principal features of these pieces has succeeded in giving the reader a glimpse of the compulsion behind the ornamentation of the silk hangings.

From the standpoint of the various aspects for which we value ancient textiles, the Central Asian silks discovered by Sir Aurel Stein constitute source material of a high order.

Catalog Numbers of Fabrics Referred to in the Text

The serial numbers at the left correspond to those in parenthesis following references to textile finds in the body of the paper. Thus, the first Astāna textile referred to bears the Stein number Ast. x. 1. 05. Complete data regarding it will be found in the "Descriptive List" for the site, *Innermost Asia*, volume II, page 709; the fabric is illustrated in volume III, plates 36, 85.

ASTANA

Innermost Asia:

1. Ast. x. 1. 05	II: p. 709; III: pls. 36, 85.
2. Ast. ix. 2. 016	II: p. 706; III: pl. 36.
3. Ast. vi. 4. 01	II: p. 701; III: pl. 93.
4. Ast. i. 6. 05-06	II: p. 685; III: pl. 100.
5. Ast. i. 7. 03	II: p. 684; III: pl. 84.
6. Ast. vi. 3. 02	II: p. 700.
7. Ast. iii. 4. 019	II: p. 695; III: pl. 89.
8. Ast. ix. 2. 021	II: p. 706.
9. Ast. vi. 3. 09	II: p. 701.
10. Ast. iii. 2. 02	II: p. 689; III: pl. 36.
11. Ast. i. 1. 09	II: p. 681.
12. Ast. vii. 1. 02	II: p. 703.
13. Ast. iii. 4. 01	II: p. 693.
14. Ast. ix. 2. 025	II: p. 707; III: pl. 77.
15. Ast. i. 5. a. 01. c	II: p. 683; III: pl. 84.
16. Ast. ix. 2. 09	II: p. 706.
17. Ast. ii. 1. 022	II: p. 687; III: pl. 93.
18. Ast. vi. 02	II: p. 698; III: pl. 78.
19. Ast. x. 1. 06	II: p. 709; III: pl. 83.
20. Ast. x. 1. 08	II: p. 709.
21. Ast. v. 2. 01	II: p. 697; III: pls. 78, 81.
22. Ast. vi. 03	II: p. 698; III: pl. 77.
23. Ast. vi. 1. 04	II: p. 698; III: pl. 45.
24. Ast. vi. 01	II: p. 697; III: pl. 45.
25. Ast. vi. 3. 07	II: p. 701; III: pl. 78.
26. Ast. ix. 2. 014	II: p. 706; III: pl. 77.
27. Ast. ix. 2. 019	II: p. 706.
28. Ast. ii. 1. 014	II: p. 687.
29. Ast. ii. 1. 021	II: p. 687.
30. Ast. i. 7. 01	II: p. 684; III: pl. 82.
31. Ast. x. 1. 04	II: p. 709; III: pl. 82.
32. Ast. ix. 2. 012	II: p. 706; III: pl. 82.
33. Ast. vi. 3. 03	II: p. 700; III: pl. 78.
34. Ast. vi. 1. 01	II: p. 698.
35. Ast. vi. 1. 02	II: p. 698; III: pl. 86.

36. Ast. ix. 2. 054 — II: p. 707; III: pl. 109.
37. Ast. i. 2. 03 — II: p. 681.
38. Ast. i. 1. 02 — II: p. 680.
39. Ast. ix. 2. b. 012 — II: p. 708; III: pl. 108.
40. Ast. v. 1. 02 — II: p. 697.
41. Ast. ix. 1. 04 — II: p. 705.
42. Ast. ix. 1. 05 — II: p. 705.
43. Ast. iii. 4. 010. a-j — II: p. 693; III: pls. 105, 106.
44. Ast. iii. 4. 09 — II: p. 693.
45. Ast. iii. 2. 04 — II: p. 689.
46. Ast. i. 5. 03 — II: p. 683; III: pl. 76.
47. Ast. ix. 302 — II: p. 708; III: pl. 80.
48. Ast. ix. 303 — II: p. 708; III: pl. 78.

CH'IEN-FO-TUNG

Serindia:

1. Ch. 00442 — II: p. 1000.
2. Ch. xxxvii. 005 — II: p. 1041; 1921b, pls. 4, 5.
3. Ch. 00278 — II: p. 985; IV: pl. 119.
4. Ch. 00279 — II: p. 985; IV: pl. 110.
5. Ch. xx. 006 — II: p. 1018; IV. pl. 106.
6. Ch. xlviii. 001 — II: p. 1049; IV: pls. 106, 111, 116.
7. Ch. 0026 — II: p. 945; IV: pl. 112.
8. Ch. 00507 — II: p. 1007.
9. Ch. iii. 0012. a-b — II: p. 1014.
10. Ch. 00298 — II: p. 986; IV: pl. 112.
11. Ch. 00299 — II: p. 986; IV: pl. 112.
12. Ch. 00385 — II: p. 995.
13. Ch. 00320 — II: p. 988.
14. Ch. 00509 — II: p. 1007.
15. Ch. lv. 0034 — II: p. 1071; IV: pls. 80. 106.
16. Ch. 00370. a-b — II: p. 992.
17. Ch. 00232 — II: p. 982; IV: pl. 112.
18. Ch. 00118 — II: p. 963; IV: pl. 111.
19. Ch. lv. 0028 — II: p. 1070; IV: pls. 107, 108, 122.
20. Ch. 00237 — II: p. 982.
21. Ch. 00297 — II: p. 986; IV: pl. 112.
22. Ch. 00312 — II: p. 988; IV: pl. 120.
23. Ch. 00313 — II: p. 988; IV. pl. 120.
24. Ch. 00336 — II: p. 989; IV: pl. 120.
25. Ch. 00346 — II: p. 989; IV: pl. 120.
26. Ch. 00344 — II: p. 989; IV: pl. 120.
27. Ch. 00332 — II: p. 988.
28. Ch. 0065 — II: p. 952.
29. Ch. 00228 — II: p. 981; IV: pl. 106.

30. Ch. 00229 — II: p. 981; IV: pl. 106.
31. Ch. 00364 — II: p. 992.
32. Ch. 00170 — II: p. 971; IV: pl. 55.
33. Ch. xxvi. 002 — II: p. 1030; IV: pl. 111.
34. Ch. 0075 — II: p. 954.
35. Ch. 00119 — II: p. 964.
36. Ch. xxvi. 003 — II: p. 1030; IV: pl. 106.
37. Ch. 00443 (a) — II: p. 1000.
38. Ch. xxii. 0019 — II: p. 1024; IV: pl. 106.
39. Ch. 00260 — II: p. 983; IV: pl. 104.
40. Ch. 00100 — II: p. 958; IV: pl. 105.
41. Ch. 00304. a-b — II: p. 987; IV: pls. 113, 114.
42. Ch. 00305 — II: p. 987; IV: pl. 113.
43. Ch. lii. 001 — II: p. 1052; 1921b, pl. 31.
44. Ch. 0025 — II: p. 944; IV: pl. 77.
45. Ch. 009 — II: p. 939; IV: pl. 79.
46. Ch. 00230 — II: p. 982; IV: pl. 118.
47. Ch. 0016 — II: p. 942.
48. Ch. 00224 — II: p. 981.
49. Ch. 00181 — II: p. 973; IV: pls. 111, 116. A.
50. Ch. 00359 — II: p. 992; IV: pl. 115.
51. Ch. 00182 — II: p. 973; IV: pls. 111, 118.
52. Ch. 00291-2 — II: p. 986; IV: pl. 116. A.
53. Ch. 00357 — II: p. 991; IV: pl. 116. A.

DANDAN-UILIQ

Ancient Khotan:

1. D. x. 4 — p. 300; II: pl. 63.

ENDERE

Serindia:

1. E. VII. ii. 001. b — I: p. 291.

Ancient Khotan:

2. E. i. 027 — p. 441; II: pl. 77.
3. E. i. 018 — p. 441; II: pl. 77.
4. E. i. 029 — p. 442; II: pl. 76.

KARA-KHOJA

Innermost Asia:

1. Kao. III. 03 — p. 601; III: pl. 88.
2. Kao. III. 063 — p. 604; III: pl. 88.

KHARA-KHOTO

Innermost Asia:

1. K. K. II. 018 — I: p. 472; III: pl. 83.
2. K. K. I. 02 — I: p. 466.
3. K. K. II. 0285. b. xii — I: p. 497.
4. K. K. II. 0260. w — I: p. 489.
5. K. K. II. 0283. a. xxvi — I: p. 495.
6. K. K. III. 01 — I: p. 498.
7. K. K. II. 067. — I: p. 473.
8. K. K. II. 0277. iii — I: p. 493.
9. K. K. II. 0304. s — I: p. 497.

LOU-LAN, SITE A

Serindia:

1. L. A. I. 002 — I: p. 432; IV. pl. 37.

Innermost Asia:

2. L. A. VI. ii. 06 — I: p. 223.
3. L. A. VI. ii. 059 — I: p. 223; III: pl. 17.
4. L. A. IV. v. 014 — I: p. 222.

Serindia:

5. L. A. VI. ii. 0235 — I: p. 438; IV: pl. 39.
6. L. A. 00147 — I: p. 432.
7. L. A. VI. ii. 0044 — I: p. 438.

LOU-LAN, SITE C

Innermost Asia:

1. L. C. x. 04 — I: p. 258; III: pls. 35, 37.
2. L. C. iii. 017 — I: p. 254; III: pl. 42.
3. L. C. ii. 011 — I: p. 252.
4. L. C. ii. 07. c — I: p. 251.
5. L. C. v. 013 — I: p. 256; III: pl. 45.
6. L. C. ii. 016 — I: p. 252.
7. L. C. 032 — I: p. 249; III: pl. 42.
8. L. C. v. 015 — I: p. 256.
9. L. C. 033 — I: p. 249; III: pl. 45.
10. L. C. iii. 04. d — I: p. 253.
11. L. C. iv. 01. a-b — I: p. 254; III: pl. 43.
12. L. C. vii. 09 — I: p. 257; III: pl. 40.
13. L. C. 07. a — I: p. 247; III: pl. 34.
14. L. C. iii. 011 — I: p. 253; III: pls. 34, 38.
15. L. C. ii. 01 — I: p. 250; III: pls. 36, 40.
16. L. C. v. 014 — I: p. 256.
17. L. C. iii. 02 — I: p. 253; III: pl. 34.
18. L. C. 02 — I: p. 246; III: pls. 35, 41.

MIRAN

Serindia:

1. M. X. 001	I: p. 547.
2. M. III. 0015	I: p. 545; IV: pl. 39.
3. M. I. viii. 0017	I: p. 481; IV: pl. 111.

MURTUK

Innermost Asia:

1. M. B. I. iii. 011	II: p. 639.
2. M. B. I. ix. 02	II: p. 639.

NIYA

Serindia:

1. N. xxii. 1. 002	I: p. 254.

TOYUK

Innermost Asia:

1. Toy. II. 03	II: p. 620; III: pl. 66.
2. Toy. IV. vii. 03. a	II: p. 627; III: pl. 82.

TUN-HUANG LIMES

Serindia:

1. T. XIII. 1. 003. a	II: p. 777.
2. T. XII. a. ii. 20	II: p. 777; IV: pl. 39.
3. T. XII. a. ii. 2	II: p. 776; IV: pls. 153, 154.
4. T. XII. a. ii. 1, 3, 5	II: p. 776; IV: pls. 153-156.
5. T. XVI. 001	II: p. 783.
6. T. XIV. a. i. 002	II: p. 780.
7. T. XV. a. i. 006	II: p. 782; IV: pl. 54.
8. T. VIII. 001	II: p. 771; IV: pl. 102.
9. T. XIV. 1. 005	II: p. 778.
10. T. XXII. c. 0010. a	II: p. 786; IV: pls. 55, 118.

YING-P'AN

Innermost Asia:

1. Ying. III. 3. 01	II: p. 760.

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